EXHIBIT 6

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re *Ex Parte* Reexamination of:	)	
	)	
U. S. Patent No. 8,194,924	)	Control No.: *To be assigned*
	)	
Issue Date: Jun. 5, 2012	)	Group Art Unit: *To be assigned*
	)	
Inventor: Timothy R. Pryor	)	Examiner: *To be assigned*
	)	
Appl. No. 13/051,698	)	Confirmation No.: *To be assigned*
	)	
Filing Date: Mar. 18, 2011	)	
	)	
For: CAMERA BASED SENSING IN	)	
HANDHELD, MOBILE, GAMING,	)	
OR OTHER DEVICES	)	

Mail Stop *Ex Parte* Reexam
Attn: Central Reexamination Unit
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Commissioner:

REQUEST FOR *EX PARTE* REEXAMINATION OF U.S. PATENT NO. 8,194,924

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LIST OF EXHIBITS:

Ex. PA-SB08	USPTO form SB/08
Ex. PAT-A	U.S. Patent No. 8,194,924 ("the '924 patent")
Ex. PAT-B	Prosecution History of the '924 patent
Ex. PAT-C	U.S. Patent No. 8,878,949 to Pryor
Ex. PAT-D	U.S. Patent No. 6,750,848 to Pryor
Ex. PA-DEC	Declaration of Dr. Gregory D. Abowd
Ex. PA-DEC CV	Curriculum vitae of Dr. Gregory D. Abowd
Ex. PA-1	U.S. Patent No. 5,982,853 to Liebermann ("*Liebermann*")
Ex. PA-2	U.S. Patent No. 6,115,482 to Sears *et al.* ("*Sears*")
Ex. PA-3	U.S. Patent No. 6,622,015 to Himmel *et al.* ("*Himmel*")
Ex. PA-4	U.S. Patent No. 6,434,403 to Ausems *et al.* ("*Ausems*")
Ex. PA-5	U.S. Patent No. 6,401,085 to Gershman *et al.* ("*Gershman*")
Ex. PA-6	Microsoft Announces Release of Windows CE 2.0 - Stories
Ex. PA-7	U.S. Patent No. 5,880,732 to Tryding ("*Tryding*")

Ex. PA-8	Ca. Patent App. 2,175,288 to Bushnag ("*Bushnag*")
Ex. PA-9	Bushnag Bibliographic Summary, Canadian Patents Database
Ex. PA-10	Logic Reference Guide
Ex. PA-11	U.S. Patent No. 5,953,322 to Kimball ("*Kimball*")
Ex. PA-12	V. Pavlovic *et al.*, *Visual Interpretation of Hand Gestures for Human-Computer Interaction: A Review*, 19 IEEE TRANSACTIONS ON PATTERN ANALYSIS AND MACHINE INTELLIGENCE 677 (1997).
Ex. PA-13	U.S. Patent No. 5,454,043 to Freeman ("*Freeman*")
Ex. PA-14	U.S. Patent No. 6,256,033 to Nguyen ("*Nguyen*")
Ex. PA-15	RESERVED
Ex. PA-16	U.S. Patent No. 4,988,981 to Zimmerman ("*Zimmerman*")
Ex. PA-17	U.S. Patent No. 6,147,678 to Kumar ("*Kumar*")
Ex. PA-18	U.S. Patent No. 5,594,469 to Freeman ("*Freeeman-469*")
Ex. PA-19	U.S. Patent No. to 6,144,366 to Numazaki ("*Numazaki*")
Ex. COMPLAINT-1	Complaint (Dkt. #1) in *Gesture Partners, LLC v. Samsung Elecs. Co.*, No 2-21-CV-00041 (E.D. Tex. Feb. 4, 2021)

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Ex. CC-1	GTP's Opening Claim Construction Brief (Dkt. #64) in *Gesture Partners, LLC v. Huawei Device Co.*, No 2-21-CV-00040 (E.D. Tex. Aug. 15, 2021) (consolidated with *Gesture Partners, LLC v. Samsung Elecs. Co.*, No 2-21-CV-00041)
Ex. CC-2	Claim Construction Memorandum and Order (Dkt. #93) in *Gesture Partners, LLC v. Huawei Device Co.*, No 2-21-CV-00040 (E.D. Tex. Oct. 12, 2021) (consolidated with *Gesture Partners, LLC v. Samsung Elecs. Co.*, No 2-21-CV-00041)

<div align="right">Request for *Ex Parte* Reexamination
U.S. Patent No. 8,194,924</div>

I.   Introduction

An *ex parte* reexamination is requested on claims 1-14 ("the challenged claims") of U.S. Patent No. 8,194,924 that issued on June 5, 2012 to Pryor ("the '924 patent," Ex. PAT-A), for which the U.S. Patent and Trademark Office ("Office") files identify Gesture Technology Partners, LLC ("GTP") as the assignee. In accordance with 37 C.F.R. § 1.510(b)(6), Requester Samsung Electronics Co., Ltd. ("Requester") hereby certifies that the statutory estoppel provisions of 35 U.S.C. § 315(e)(1) and 35 U.S.C. § 325(e)(1) do not prohibit it from filing this *ex parte* reexamination request.

This request raises substantial new questions of patentability based on prior art that the Office did not have before it or did not fully consider during the prosecution of the '924 patent, and which discloses the features recited in the challenged claims.[1] The Office should find the claims unpatentable over this art.

On February 4, 2021, Patent Owner ("PO") initiated a litigation campaign asserting, *inter alia*, infringement of the '924 patent against five defendants across two different venues in *Gesture Technology Partners, LLC v. Huawei Device Co., Ltd.*, Case No. 2-21-cv-00040 (EDTX), *Gesture Technology Partners, LLC* v. *Samsung Electronics Co., Ltd.*, Case No. 2-21-cv-00041 (EDTX), *Gesture Technology Partners, LLC v. Apple Inc.*, Case No. 6-21-cv-00121 (WDTX), *Gesture Technology Partners, LLC v. Lenovo Group Ltd.*, Case No. 6-21-cv-00122 (WDTX), and *Gesture Technology Partners, LLC v. LG Electronics, Inc.*, Case No. 6-21-cv-00123 (WDTX). The *LG* case was transferred to *Gesture Technology Partners, LLC v. LG Electronics Inc.*, Case No. 2-21-cv-19234 (DNJ). Requester respectfully urges that this Request be granted and that reexamination be conducted with "special dispatch" pursuant to 35 U.S.C. § 305.

In accordance with 37 C.F.R. § 1.20(c), the fee for *ex parte* reexamination (non-streamlined) is submitted herewith. If this fee is missing or defective, please charge the fee as well as any additional fees that may be required to Deposit Account No. 50-2613.

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[1] At the time of filing of this Request, there are two pending *inter partes* reviews, *Apple Inc. v. Gesture Technology Partner, LLC*, IPR2021-00923 (filed May 26, 2021), and *LG Electronics, Inc. et al. v. Gesture Technology Partners, LLC*, IPR2022-00093 (filed November 5, 2021), challenging the claims of the '924 patent based on prior art not presented in this Request.

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Request for *Ex Parte* Reexamination
U.S. Patent No. 8,194,924

II. Identification of Claims and Citation of Prior Art Presented

Requester respectfully requests reexamination of claims 1-14 of the '924 patent in view of the following prior art references, which are also listed on the attached PTO Form SB/08 (Ex. PA-SB08).

Ex. PA-1	U.S. Patent No. 5,982,853 to Liebermann ("*Liebermann*")
Ex. PA-2	U.S. Patent No. 6,115,482 to Sears *et al.* ("*Sears*")
Ex. PA-3	U.S. Patent No. 6,622,015 to Himmel *et al.* ("*Himmel*")
Ex. PA-5	U.S. Patent No. 6,401,085 to Gershman *et al.* ("*Gershman*")
Ex. PA-7	U.S. Patent No. 5,880,732 to Tryding ("*Tryding*")
Ex. PA-11	U.S. Patent No. 5,953,322 to Kimball ("*Kimball*")

A copy of each of the above-listed references is attached to this request pursuant to 37 C.F.R. § 1.510(b)(3). A copy of the '924 patent is also attached to this request as Exhibit PAT-A pursuant to 37 C.F.R. § 1.510(b)(4).

III. Overview of the '924 Patent

A. Specification and Drawings of the '924 Patent

The '924 patent generally relates to "simple input devices" for "optical[] sensing." (Ex. PAT-A, 2:7-11.) The devices operate by "optically sensing a human input to a display screen or other object and/or the sensing of human positions or orientations." (*Id.*, 2:8-11.) The optical sensing devices may use "single or multiple TV cameras whose output is analyzed and used as input to a computer, such as a home PC, to typically provide data concerning the location of parts of, or objects held by, a person or persons." (*Id.*, 2:20-23.) Alternatively, "suitable electro-optical sensors" may be used in place of the TV cameras. (*Id.*, 3:21-22.)

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The embodiment disclosed in the context of Figure 18 (reproduced below) "illustrates an improved handheld computer embodiment of the invention, in which the camera or cameras may be used to look at objects, screens and the like as well as look at the user." (*Id.*, 3:11-14.)
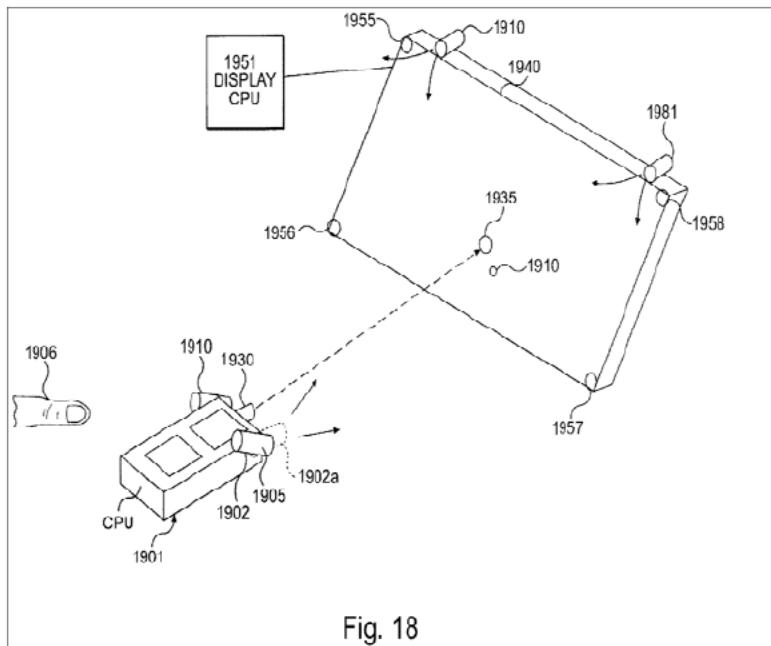
Fig. 18

(*Id.*, FIG. 18.) As shown in Figure 18, the handheld computer incorporates "a camera 1902 which can optionally be rotated about axis 1905 so as to look at the user or a portion thereof such as finger 1906, or at objects at which it is pointed." (*Id.*, 25:40-43.) The camera arrangement can optionally incorporate "a stereo pair of cameras to further include camera 1910," and both cameras can rotate. (*Id.*, 25:43-45.) "Alternatively fixed cameras can be used when physical rotation is not desired, for ruggedness, ease of use, or other reasons." (*Id.*, 25:45-49.) "When aimed at the user," the cameras can "view and obtain images of: [o]nes self," including facial expressions, "[o]nes fingers," "[o]ne or more objects in ones hand," or "[o]nes gestures." (*Id.*, 25:50-63.)

"The camera 1902 (and 1910 if used, and if desired), can also be optionally rotated and used to view points in space ahead of the device." (*Id.*, 25:64-66.) When rotated, "[t]he camera can also be used to see gestures of others, as well as the user, and to acquire raw video images of objects in its field." (*Id.*, 26:25-27.) Additionally, the stereo cameras can be positioned in this way "to observe or point at (using optional laser pointer 1930) Points such as 1935 on a wall or a mounted LCD or projection display such as 1940 on a wall or elsewhere such as on the back of an airline seat." (*Id.*, 25:64-26:5.) "The camera unit 1902 can sense the location of the display in space relative to the handheld computer, using for example the four points 1955-1958 on the

corners of the display as references. This allows the handheld device to become an accurate pointer for objects displayed on the screen including control icons." (*Id.*, 26:16-21.) It also "allows the objects on the screen to be sensed directly by the camera," such that sensing can occur even "if one does not have the capability to spatially synchronize and coordinate the display driver with the handheld computer." (*Id.*, 26:21-24.) In one instance, the '924 patent discloses that a computer may be a processing unit such as a "400 MHz Pentium II" processor. (*Id.*, 3:32-34.) In another instance, a computer may be a device "such as a home PC" that is capable of "providing data concerning the location of parts of, or objects held by, a person or persons." (*Id.*, 2:20-23.)

B.   Claims of the '924 Patent

The '924 patent includes fourteen claims total and claim 1 is the only independent claim. (*Id.*, 26:54-28:14.) Independent claim 1, among other claim features, recites a handheld device comprising a housing, a computer, a first camera, and a second camera. (*Id.*, 26:54-65.) The first camera is "oriented to view a user of the handheld device and ha[s] a first camera output." (*Id.*) The second camera is "oriented to view an object other than the user of the device and ha[s] a second camera output. (*Id.*) The claim also recites that "wherein the first and second cameras include non-overlapping fields of view, and wherein the computer is adapted to perform a control function of the handheld device based on at least one of the first camera output and the second camera output." (*Id.*)

The dependent claims further specify, among other limitations, a mobile phone device; types of images the cameras are adapted to acquire; various computer determinations based on one or more camera outputs; persons that perform gestures; a computer recognition processes based on the second camera output; the computer is adapted to generate control instructions for a display; the computer is adapted to determine a reference frame of the object; the computer is adapted to perform a control function based on camera outputs; and the computer is adapted to transmit information over an internet connection. (*Id.*, 26:66-28:14.)

C.   Prosecution History of the '924 Patent

The Examiner initially rejected the claims under 35 U.S.C. § 112, first paragraph as failing to comply with the written description requirement. (Ex. PAT-B, 107-10.) In response, the Applicant asserted that the originally filed claims were supported by an application that was

incorporated by reference. (*Id.*, 128-29.) The Examiner then withdrew the written description rejection and turned to the merits of the originally filed claims. (*Id.*, 134-42.)

Originally filed claim 24 was amended during prosecution and issued as the only independent claim of the '924 patent. (Ex. PAT-B; Ex. PAT-A.) In originally filed claim 24, the Applicant claimed a handheld device comprising a housing, a computer within the housing, "a first camera oriented to view a user of the handheld device" and "a second camera oriented to view an object other than the user of the device." (Ex. PAT-B, 55-58.) The Examiner rejected claim 24 based on a combination of *Silverbrook* and *Kimura*. (*Id.*, 134-42.) Specifically, the Examiner found it would have been obvious to orient two camera sensors on two sides of a device to capture the user and another object as claimed because *Kimura* taught two cameras that were positioned on different sides of a device. (*Id.*) In response, the Applicant did not dispute that, as a matter of physical positioning, a camera on one side of a device was oriented to view a user and a camera on a different side of the device was oriented to view an object other than the user as claimed. (*Id.*, 159-62.) Instead, the Applicant amended its claims to require the first and second cameras to have outputs and non-overlapping fields of view, and amended the computer to perform a control function of the handheld device based on at least one of the first camera output and the second camera output. (*Id.*, 157-58.) It also argued that neither *Silverbrook* nor *Kimura* taught a computer adapted to perform a control function based on a camera output as claimed because "Kimura merely transfers video data to a user." (*Id.*, 159-62.) In fact, *Kimura* did no more than display a video. (*Id.*) The Applicant asserted that "[b]y contrast, the present invention provides a handheld device with added functionality and an enhanced method of interacting with the handheld device." (*Id.*, 160-61.) After these amendments and arguments, the '924 patent issued. (*Id.*, 166-72.)

The references forming the substantial new questions of patentability ("SNQ")— *Liebermann*, *Tyding*, *Gershman*, *Himmel*, *Kimball*, and *Sears*—were not cited or considered during prosecution of the '924 patent. (Ex. PAT-A, Cover; Ex. PAT-B.) Likewise, these references are not cited and will not be considered in the pending IPRs. *Apple Inc. v. Gesture Technology Partners, LLC*, IPR2021-00923 (filed May 26, 2021); *LG Electronics, Inc. et al. v. Gesture Technology Partners, LLC*, IPR2022-00093 (filed November 5, 2021).

D.   The Effective Priority Date of Claims 1-14 of the '924 Patent

For purposes of this reexamination only, Requester assumes that claims 1-14 are entitled to the filing date of Provisional Application No. 60/142,777 identified on the cover of the '924 patent, which is July 8, 1999. (Ex. PAT-A, Cover.)

Liebermann issued on November 9, 1999 from Application No. 08/653,732 filed May 23, 1996; *Himmel* issued on September 16, 2003 from Application No. 09/240,960 filed January 29, 1999; *Gershman* issued on June 4, 2002 from Application No. 09/263,969 filed March 5, 1999; *Tryding* issued on March 9, 1999 from Application No. 845,937 filed April 29, 1997; *Sears* issued on September 5, 2000 from Application No. 09/176,999 filed October 22, 1998; *Kimball* issued on September 14, 1999 from Application No. 08/792,532 filed January 31, 1997.   Thus, *Liebermann*, *Himmel*, *Tryding*, *Gershman*, *Sears*, and *Kimball* qualify as prior art at least under pre-AIA 35 U.S.C. § 102(e).

IV.   Claim Construction

In a reexamination proceeding involving claims of an expired patent, claim construction pursuant to the principle set forth by the court in *Phillips v. AWH Corp.*, 415 F.3d 1303, 1316, 75 U.S.P.Q.2.d 132, 1329 (Fed. Cir. 2005) (words of a claim 'are generally given their ordinary and customary meaning' as understood by a person of ordinary skill in the art in question at the time of the invention) should be applied since the expired claim[s] are not subject to amendment. MPEP § 2258 I.(G) (citing *Ex Parte Papst-Motoren*, 1 U.S.P.Q.2.d 1655 (Bd. Pat. App. & Inter. 1986)). The '924 patent, which lists July 7, 2000 as the date of the earliest related continuation and does not list any term extensions or adjustments, has expired. *See* Ex. PAT-A; 35 U.S.C. § 154. Therefore, the claim interpretations submitted or implied herein for the purpose of this reexamination adhere to the *Phillips* standard. *See In re CSB-System Int'l, Inc.*, 832 F.3d 1335, 1340-42 (Fed. Cir. 2016).[2]

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[2] Requester reserves all rights to raise claim constructions and other arguments in other venues. For example, Requester has not necessarily raised all challenges to the '924 patent in this proceeding, including those under 35 U.S.C. § 112, given the limitations placed by the Rules governing this proceeding. For example, Requester has alleged some terms are indefinite in district court proceedings. But given how closely the prior art maps to the claims (as explained below), those issues do not need to be resolved to assess patentability in this proceeding. In addition, a comparison of the claims to any accused products in litigation may raise controversies that need to be resolved through claim construction that are not presented here given the similarities between the references and the '924 patent. Thus, the SNQs presented herein should not be interpreted to (and do not) conflict with Requester's indefiniteness positions in other proceedings regarding the '924 patent (and how the Court ruled on such positions) (Ex. CC-2).

The district court in the related Eastern District of Texas cases recently construed/considered several terms recited in the claims of the '924 patent under the *Phillips* standard. (Ex. CC-2.)   A summary of the district court constructions/interpretations and the constructions advanced by the parties in the litigation is listed in the following table.

'924 Patent Terms	E.D. Texas Construction	Construction Advanced by Defendant(s)	Construction Advanced by PO
"oriented to view" of claim 1	plain meaning (Ex. CC-2, 41-44)	"having a field of view encompassing" (Ex. CC-2, 41-44)	no construction necessary (Ex. CC-2, 41-44)
"oriented to view a user" of claim 1	plain meaning (Ex. CC-2, 44-46)	indefinite (Ex. CC-2, 44-46)[3]	no construction necessary (Ex. CC-2, 44-46)
"oriented to view an object other than the user" of claim 1	plain meaning (Ex. CC-2, 47-48)	indefinite (Ex. CC-2, 47-48)[4]	no construction necessary (Ex. CC-2, 47-48)
"wherein the gesture is performed by a person other than the user of the handheld device" of claim 9	indefinite (Ex. CC-2, 48-50)[5]	indefinite (Ex. CC-2, 48-50)	No construction necessary (Ex. CC-2, 48-50)

[3] While the district court declined to find this term indefinite, Requester does not concede the claim is definite by demonstrating how the prior art discloses/suggests this limitation below. Instead, as noted, Requester presents how a substantial new question of patentability is raised by the prior art where the term is interpreted under the district court's (and PO's) plain meaning interpretation of the claimed term.

[4] While the district court declined to find this term indefinite, Requester does not concede the claim is definite by demonstrating how the prior art discloses/suggests this limitation below. Instead, as noted, Requester presents how a substantial new question of patentability is raised by the prior art where the term is interpreted under the district court's (and PO's) plain meaning interpretation of the claimed term.

[5] While the district court found this term indefinite, and thus claim 9 indefinite, Requester presents SNQs separately for claim 9 (SNQs 13-14) under the assumption that the Office does not agree with the district court that the term is indefinite to preclude a finding of a SNQ for claim 9. (*See infra* Sections V.M-V.N). However, should the Office determine that this term precludes the Office from determining the scope of claim 9 to support a finding of a SNQ as to claim 9 (as proposed herein), such denial (e.g. a finding against SNQs 13-14) would not preclude reexamination of the other claims challenged in the SNQs presented (*see e.g.,* Sections V.A-L (SNQs 1-11).)

"a computer within the housing . . . wherein the computer is adapted to perform a control function of the handheld device based on at least one of the first camera output and the second camera output" of claims 1, 6-8, 10, 12, and 14	plain meaning (Ex. CC-2, 51-54)	terms invoke 35 U.S.C. § 112 ¶ 6: function = e.g., "perform a control function of the handheld device based on at least one of the first camera output and the second camera output"; structure = indefinite[6] (Ex. CC-2, 51-54)	no construction necessary and the terms do not invoke 35 U.S.C. § 112 ¶ 6 (Ex. CC-2, 51-54)
"gesture" of claims 6 and 9	"movement of hands or other body parts that conveys meaning" (Ex. CC-2, 54-57)	"a sequence of positions that conveys a meaning" (Ex. CC-2, 54-57)	no construction necessary (Ex. CC-2, 54-57)
"adapted to" of claims 1, 3-5, 8, 10, 12, and 14	plain meaning (Ex. CC-2, 57-60)	computer: "programmed to"; first and second cameras: "designed to" (Ex. CC-2, 57-60)	no construction necessary (Ex. CC-2, 57-60)

The prior art mappings found in Section V of this Request explain how the claims of the '924 patent are unpatentable under the constructions of the district court as well as the constructions advanced by both PO and the Defendants. Indeed, the claims would be unpatentable under any reasonable construction of the terms given how closely the prior art maps to the claims. More generally, Section V demonstrates how the prior art meets the limitations of the challenged claims under their plain meaning (as adopted by the district court) unless otherwise noted. Specific information regarding disputed terms in the Eastern District of Texas litigation concerning the '924 patent follows.

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[6] While the district court declined to find this term indefinite, Requester does not concede the claim is definite by demonstrating how the prior art discloses/suggests this limitation below. Instead, as noted, Requester presents how a substantial new question of patentability is raised by the prior art where the term is interpreted under the district court's (and PO's) plain meaning interpretation of the claimed term, and also as construed below.

A.   **"oriented to view" of claim 1**

Defendants have contended that the claimed "oriented to view" limitation should be construed to mean "having a field of view encompassing." Indeed, this understanding is supported by the teachings of the specification. For example, the patent explains that a camera is oriented to view a user at whom it is pointed, and may be rotated if needed: "Consider hand held computer 1901 of FIG. 18, incorporating a camera 1902 which can optionally be rotated about axis 1905 so as *to look* at the user or a portion thereof such as finger 1906, or at objects *at which it is pointed*." (Ex. PAT-A, 25:40-63 (emphasis added); *see also id*., 25:64-26:5 (emphasis added) ("The camera 1902 (and 1910 if used, and if desired), can also optionally be rotated and used *to view points in space ahead of the device*, as shown in dotted lines 1902a. *In this position* for example it can be used for the purposes described in the previous application.").) The patent also explains that "*[w]hen aimed at the user*, as shown, [the camera 1902] can be used, for example, *to view* and obtain images of: Ones self . . . Ones fingers . . . Ones gestures." (*Id*. at 25:40-63 (emphasis added).) The patent further explains that "[t]he camera can also be used *to see* gestures of others, as well as *the user*, and to acquire raw video images of objects *in its field*." (*Id*., 26:25-27 (emphasis added).) In the only two-camera embodiment, the patent explains that one camera *is looking* at the wall display, while the other *is looking* at the user: "Also can have two cameras operating together, *one looking at wall thing, other at you* (as 1902 and 1902a) . . . ." (*Id*., 26:36-40 (emphasis added).) Thus, the '924 patent supports that "oriented to view" means "having a field of view encompassing." Requester demonstrates below in Section V how the prior art addresses this limitation under this interpretation.

PO has not expressed that the "oriented to view" limitations require construction. (Ex. CC-1, 15-16.) Requester demonstrates below in Section V how the prior art addresses this limitation under PO's interpretation, which also reflects the plain meaning interpretation given by the district court's construction order.

B.   **"a computer within the housing . . . wherein the computer is adapted to perform a control function of the handheld device based on at least one of the first camera output and the second camera output" of claims 1, 6-8, 10, 12, and 14**

PO has argued in district court that the "computer" limitations do not require construction and do not invoke §112, ¶ 6. (Ex. CC-1, 18-19.) Under PO's interpretation, Requester

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demonstrates below in Section V how the prior art addresses the limitations in addition to under the plain meaning given by the district court's construction order.

To the extent this limitation is found to be subject to 35 U.S.C. § 112, ¶ 6, Requester proposes the following construction (under the assumption the Office determines appropriate structure is provided in the '924 patent, which Requester does not concede).

Construing a means-plus-function claim term requires that the function recited in the claim term be first identified; then, the written description of the specification must be consulted to identify the corresponding structure that performs the identified function and equivalents thereof. *See Williamson v. Citrix Online, LLC*, 792 F.3d 1339, 1351 (Fed. Cir. 2015); *see also Gracenote, Inc. v. Iceberg Indus., LLC*, IPR2013-00551, Paper No. 6 at 15 (Feb. 28, 2014).

For claim 1, the identified function is to "perform a control function of the handheld device based on at least one of the first camera output and the second camera output." The dependent claims add to the function, including: (1) "determine a gesture based on at least one of the first camera output and the second camera output" (Claim 6); (2) "determine a facial expression based on at least one of the first camera output and the second camera output" (Claim 7); (3) "determine at least one of the position and the orientation of the object based on the second camera output" (Claim 8); (4) "recognize the object based on the second camera output" (Claim 10); (5) "determine a reference frame of the object" (Claim 12); and (6) "transmit information over an internet connection" (Claim 14).

A structure disclosed in the specification qualifies as corresponding structure only if it is clearly linked by the patent's specification (or possibly the prosecution history) to performing the claimed function. *See Default Proof Credit Card Sys., Inc. v. Home Depot U.S.A., Inc.*, 412 F.3d 1291, 1298 (Fed. Cir. 2005). Where a means-plus-function term is directed to software, the specification must "disclose an algorithm for performing the claimed function." *Williamson*, 792 F.3d at 1352. For purposes of this proceeding only, Requester interprets the corresponding structure of the above-identified function as software running on a computer configured to performed the identified function or equivalents thereof given the lack of relevant disclosure in the '924 patent specification. (*See also supra* footnote 2.).

Requester demonstrates below in Section V how the prior art addresses this limitation under this interpretation.

    C.   **"gesture" of claims 6 and 9**

Defendants have contended that the claimed "gesture" should be construed to mean "a sequence of positions that conveys a meaning." For example, the '924 patent supports the understanding that a gesture is a sequence of positions, *i.e.*, a particular type of movement. (Ex. PAT-A, 20:5-10 ("This can also include a sequence of positions, itself constituting the gesture.").) The patent also distinguishes gestures from expressions that do not require movement, such as facial expressions (e.g., a smile). (*Id.*, 22:9-12 ("In this case, it is facial expressions, hand or body gestures that are the thing most used."), 25:40-63 (describing "ones self—facial expressions" separately from "ones gestures"); *compare* Claim 6 ("operable to determine a gesture") *with* Claim 7 ("operable to determine a facial expression").) Requester demonstrates below in Section V how the prior art addresses this limitation under this interpretation.

PO has contended that the "gesture" limitations do not require construction. (Ex. CC-1, 19.) Requester likewise demonstrates below in Section V how the prior art addresses this limitation under both PO's interpretation (i.e., plain meaning) and the district court's construction order.

D. "adapted to" of claims 1, 3-5, 8-9, 12, and 14

Defendants have contended that the claimed computer that is "adapted to" operate as claimed should be construed to mean a computer that is "programmed to" operate as claimed. The claimed first and second cameras that are "adapted to" operate as claimed should be construed to mean that the first and second cameras, respectively, are "designed to" operate as claimed. For example, the PO's use of "adapted to" in lieu of the broader "operable to" phrase recited in Claims 6 supports Requester's construction.

PO has contended that the "adapted to" limitations do not require construction. (Ex. CC-1, 19-20.) Requester likewise demonstrates below in Section V how the prior art addresses this limitation under PO's interpretation, which also reflects the plain meaning interpretation given by the district court's construction order.

V. Statement of Substantial New Questions of Patentability

As mentioned above, *Liebermann*, *Himmel*, *Sears, Tryding*, *Kimball*, and *Gershman* were never made of record or considered by the Office during original prosecution of the '924 patent. But the references (in various combinations for respective claims, as discussed below) disclose or suggest all of the features of claims 1-14.

SNQ1: *Liebermann* raises a substantial new question of patentability (SNQ1) with respect to claims 1-5 and 13 of the '924 patent.

SNQ2: *Liebermann* and *Tryding* raise a substantial new question of patentability (SNQ2) with respect to claim 11 of the '924 patent.

SNQ3: *Liebermann* and *Gershman* raise a substantial new question of patentability (SNQ3) with respect to claim 14 of the '924 patent.

SNQ4: *Liebermann* and *Himmel* raise a substantial new question of patentability (SNQ4) with respect to claims 1-8, 10, and 12-13 of the '924 patent.

SNQ5: *Liebermann*, *Himmel*, and *Tryding* raise a substantial new question of patentability (SNQ5) with respect to claim 11 of the '924 patent.

SNQ6: *Liebermann*, *Himmel*, and *Gershman* raise a substantial new question of patentability (SNQ6) with respect to claim 14 of the '924 patent.

SNQ7: *Liebermann* and *Sears* raise a substantial new question of patentability (SNQ7) with respect to claims 1-8, 10, and 12-13 of the '924 patent.

SNQ8: *Liebermann*, *Sears*, and *Tryding* raise a substantial new question of patentability (SNQ8) with respect to claim 11 of the '924 patent.

SNQ9: *Liebermann*, *Sears*, and *Gershman* raise a substantial new question of patentability (SNQ9) with respect to claim 14 of the '924 patent.

SNQ10: *Liebermann* and *Kimball* raise a substantial new question of patentability (SNQ10) with respect to claim 14 of the '924 patent.

SNQ11: *Liebermann*, *Himmel*, and *Kimball* raise a substantial new question of patentability (SNQ11) with respect to claim 14 of the '924 patent.

SNQ12: *Liebermann*, *Sears*, and *Kimball* raise a substantial new question of patentability (SNQ12) with respect to claim 14 of the '924 patent.

SNQ13: *Liebermann* and *Himmel* raise a substantial new question of patentability (SNQ13) with respect to claim 9 of the '924 patent.

SNQ14: *Liebermann* and *Sears* raise a substantial new question of patentability (SNQ14) with respect to claim 9 of the '924 patent.

Thus, for these reasons and the reasons discussed below and in the accompanying declaration of Dr. Gregory D. Abowd (Ex. PA-DEC), *Liebermann* raises a substantial new question of patentability (SNQ1) with respect to claims 1-5 and 13 of the '924 patent; *Liebermann*

and *Tryding* raise a substantial new question of patentability (SNQ2) with respect to claim 11 of the '924 patent; *Liebermann* and *Gershman* raise a substantial new question of patentability (SNQ3) with respect to claim 14 of the '924 patent; *Liebermann* and *Himmel* raise a substantial new question of patentability (SNQ4) with respect to claims 1-10 and 12-13 of the '924 patent; *Liebermann*, *Himmel*, and *Tryding* raise a substantial new question of patentability (SNQ5) with respect to claim 11 of the '924 patent; *Liebermann*, *Himmel*, and *Gershman* raise a substantial new question of patentability (SNQ6) with respect to claim 14 of the '924 patent; *Liebermann* and *Sears* raise a substantial new question of patentability (SNQ7) with respect to claims 1-10 and 12-13 of the '924 patent; *Liebermann*, *Sears*, and *Tryding* raise a substantial new question of patentability (SNQ8) with respect to claim 11 of the '924 patent; *Liebermann*, *Sears*, and *Gershman* raise a substantial new question of patentability (SNQ9) with respect to claim 14 of the '924 patent; *Liebermann* and *Kimball* raise a substantial new question of patentability (SNQ10) with respect to claim 14 of the '924 patent; *Liebermann*, *Himmel*, and *Kimball* raise a substantial new question of patentability (SNQ11) with respect to claim 14 of the '924 patent; *Liebermann*, *Sears*, and *Kimball* raise a substantial new question of patentability (SNQ12) with respect to claim 14 of the '924 patent; *Liebermann* and *Himmel* raise a substantial new question of patentability (SNQ13) with respect to claim 9 of the '924 patent; *Liebermann* and *Sears* raise a substantial new question of patentability (SNQ14) with respect to claim 9 of the '924 patent.[7]

A.   SNQ1: *Liebermann*

As explained below and in the attached declaration of Dr. Abowd (Ex. PA-DEC), *Liebermann* discloses or suggests the limitations of claims 1-5 and 13 of the '924 patent. (Ex. PA-DEC, ¶ 54.)

1.   Overview of *Liebermann*

Like the '924 patent, *Liebermann* discloses a handheld device that uses one or more cameras to sense hand gestures. (Ex. PA-1, 13:5-16; FIGs. 1 and 6.) Specifically, *Liebermann* discloses a cellular telephone device and a corresponding housing. (*Id.*, FIG. 6.) The cellular telephone may include multiple cameras, with the first camera being oriented to view the "hands and fingers and body and facial motions and expression" of a user. (*Id.*, 5:62-6:10; 13:5-16.) A second camera may be positioned at a different angle so as to view a different object. (*Id.*, 13:5-

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[7] *See supra* n.5.

16.) The cellular telephone performs various imaging functions, displays data, etc. (*Id.*, 5:62-6:10, 6:40-52, FIG. 8; Ex. PA-DEC, ¶ 44.) Moreover, the cellular telephone controls the hardware of the device to perform various functions based on camera data. (Ex. PA-1, 5:63-6:10, 6:40-52, FIG. 8; Ex. PA-DEC, ¶ 44.)

Thus, *Liebermann* is in the same or similar technical field as the '924 patent, and a person of ordinary skill in the art ("POSITA") would have had reason to consider the teachings of *Liebermann*. (Ex. PAT-A, 2:7-21 ("The invention relates to simple input devices for computers . . . . The invention uses single or multiple TV cameras whose output is analyzed and used as input to a computer."); Ex. PA-DEC, ¶ 45.) To the extent *Liebermann* is not within the field of endeavor of the '924 patent (it is), *Liebermann* is reasonably pertinent to problems associated with detecting gestures and/or inputting information to a portable device, problems with which the inventor was involved. (Ex. PA-1, FIG. 1, 5:62-6:52; Ex. PAT-A, 2:5-35; Ex. PA-DEC, ¶ 45.)

2.   Claim 1

a.   [1.a] A handheld device comprising:

To the extent the preamble is limiting, *Liebermann* discloses this limitation. (Ex. PA-DEC, ¶ 55.) For example, *Liebermann* discloses a "cellular telephone." (Ex. PA-1, 4:20-21; *see also* Ex. PAT-A, 11:65-67 (describing a "cell phone" as a handheld device).)
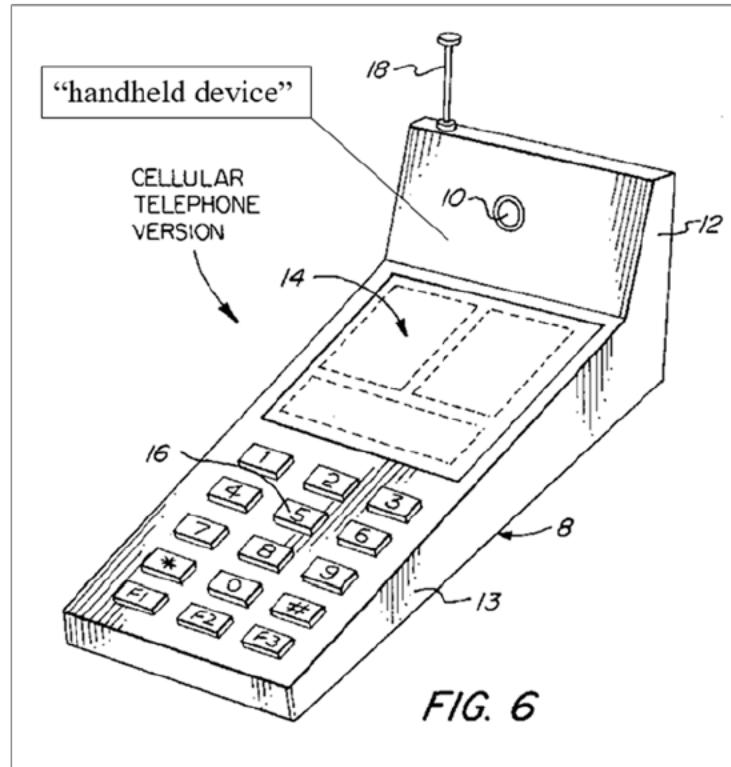
FIG. 6

(Ex. PA-1, FIG. 6 (annotated).) As can be seen in Figure 6, the cellular telephone of *Liebermann* is in a handheld form factor, and indeed *Liebermann* describes the cellular telephone as being a "portable" device. (*Id.*, 5:62-65.)

b.   [1.b] a housing;

Liebermann discloses this limitation. (Ex. PA-DEC, ¶ 57-58.) For example, the external surfaces of the cellular telephone depicted in Figure 6 comprise "a housing" for the internal circuitry of the cellular telephone. (Ex. PA-1, FIG. 6; Ex. PA-DEC, ¶ 58) *Liebermann* describes the housing of the cellular telephone as including an "upright portion 12" and a "base portion 13." (Ex. PA-1, 5:62-67.)

c.   [1.c] a computer within the housing;

Liebermann discloses this limitation. (Ex. PA-DEC, ¶ 59.) In particular, *Liebermann* discloses that the cellular telephone includes hardware that works with one or more cameras or sensors to view and obtain images of hand signs (i.e., one's gestures), performs related "initial processing," and populates a phone display, among other things. (Ex. PA-1, 5:62-6:10, 6:40-52, FIG. 8; Ex. PA-DEC, ¶ 60.) Specifically, the cellular telephone performs functions that a POSITA would have understood were performed by a computer, such as to control cameras, drive a display,

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transmit information, receive information, process data, process touchless function buttons, etc. (*Id.*, 5:62-6:47, FIGs 1, 8.) *See* MPEP § 2114 ("[T]he term 'computer' is commonly understood by one of ordinary skill in the art to describe a variety of devices with varying degrees of complexity and capabilities. *In re Paulsen*, 30 F.3d 1475, 1479-80, 31 USPQ2d 1671, 1674 (Fed. Cir. 1994). Therefore, a claim containing the term 'computer' should not be construed as limited to a computer having a specific set of characteristics and capabilities, unless the term is modified by other claim terms or clearly defined in the specification to be different from its common meaning.").

To enable a sign-language friendly device, *Liebermann* discloses that the computer hardware performs the "initial processing" in which "each of the frames containing a captured image undergoes a process whereby the image is collapsed into a small set of fixed identifiers. At the end of the initial processing, the resulting information is sent as data." (Ex. PA-1, 6:40-52.) A POSITA would have appreciated that the computer hardware can also control the screens of the cellular telephone to display "text of what was signed," etc., as computing hardware is necessary to perform such a function.   (*Id.*, FIG. 8; Ex. PA-DEC, ¶61.)
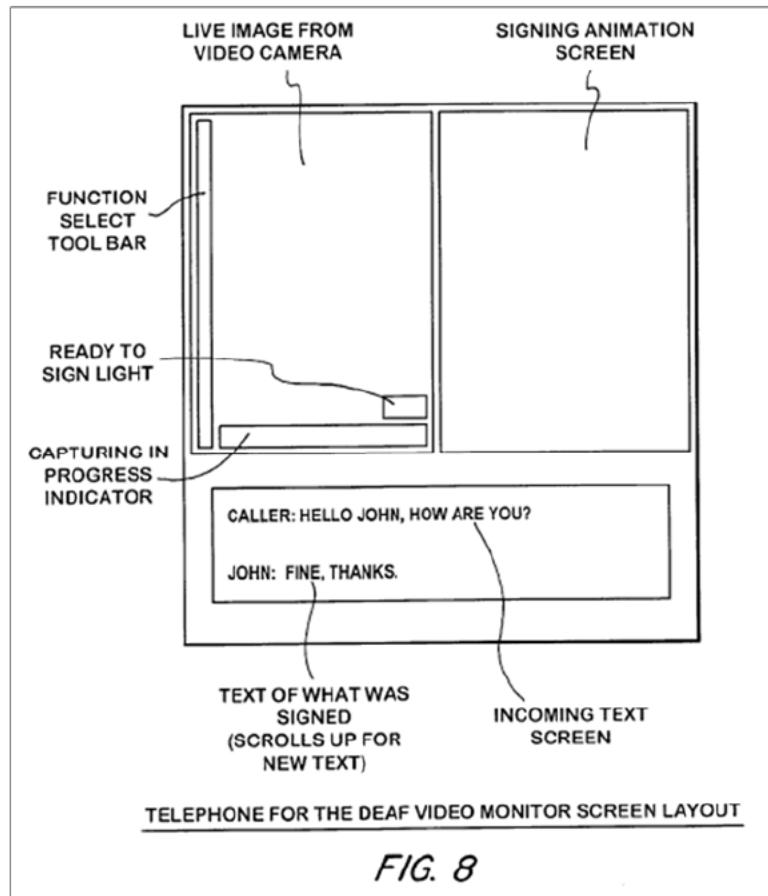
FIG. 8

(Ex. PA-1, FIG. 8.) Furthermore, a POSITA would have understood that the computing hardware of the phone is within the cellular telephone and thus within the cell phone housing because the cellular telephone (rather than a remote computer) performs initial processing, controls a display, etc. (*Id.*, 5:62-6:10, 6:40-52, FIG. 8; Ex. PA-DEC, ¶ 61.)

> d.   **[1.d] a first camera oriented to view a user of the handheld device and having a first camera output; and**

Liebermann discloses this limitation. (Ex. PA-DEC, ¶ 62.) *Liebermann* discloses that the cellular telephone includes a video camera ("first camera") that outputs image data ("having a first camera output"). (Ex. PA-1, 5:62-6:10 (emphasis added) ("A portable transmitter/receiver generally designated by the numeral 8 . . . is shown in FIG. 6 and it contains a video **camera**, the lens 10 of which is disposed in the upright portion 12. . . . **The signing motions captured by the camera are converted into digital data for processing** by the translation software, (i.e., artificial intelligence) to produce data representing numbers, words and phrases which are then combined into coherent sentences.").)

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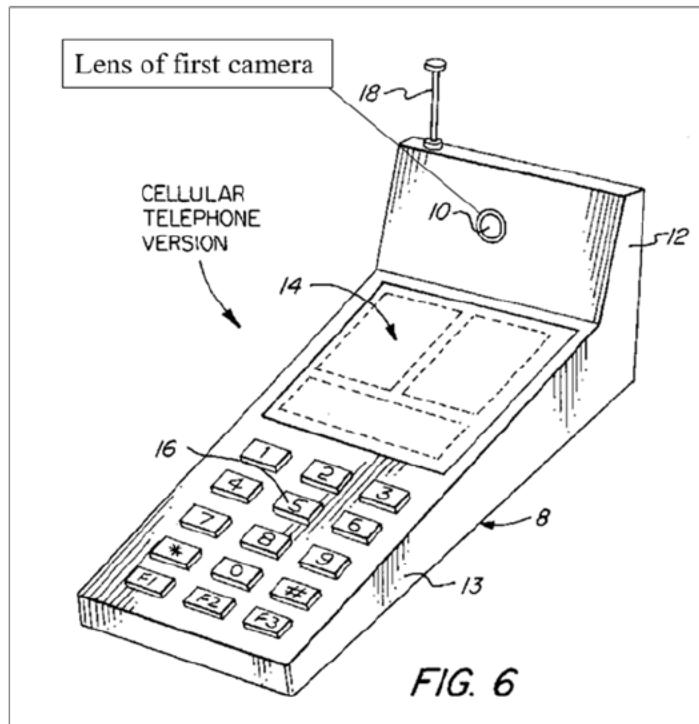
FIG. 6

(*Id.*, FIG. 6.)

The video camera is "oriented to view a user of the handheld device," as claimed, to detect sign language gestures. (Ex. PA-DEC, ¶ 64.) Specifically, "camera lens 10" of the video camera views a user and "will record the signing movement of the hands and fingers and body and facial motions and expressions," where "**[a] deaf person uses sign language in front of the transmitter/receiver device containing the camera**" and "[t]he **images captured by the camera are of the finger and hand motions and of body motions and of facial expressions** and motions captured by a digital device which does initial processing." (Ex. PA-1, 6:4-47 (emphasis added); Ex. PA-DEC, ¶ 64.) The cellular telephone camera, which views the face, hands, and body of a person using the cellular telephone (to process hand gestures) and thus has a field of view encompassing the person using the cellular telephone, is "oriented to view a user of the handheld device." (Ex. PA-DEC, ¶ 64.) To be sure, the '924 patent refers to a finger as a "portion" of a user. (Ex. PAT-A, 25:40-43.) However, the '924 patent does not require a camera that is "oriented to view a user" to necessarily view a person from head to toe. (*See generally* Ex. PAT-A; *see also* Ex. PAT-A, claim 3 (emphasis added) ("The handheld device of claim 1 wherein the first camera is adapted to acquire an image of at least a *portion* of the user").) Therefore, a POSITA would have understood the *Liebermann* camera, which views the face, hands, and body of a person using

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a device, is "oriented to view a user of the handheld device." (Ex. PA-1, 6:4-47; Ex. PA-DEC, ¶ 64.)

For similar reasons, *Liebermann* discloses that the first camera is "oriented to view" a user under Requester's construction discussed above. (Ex. PA-DEC, ¶ 65.) For example, the first camera records the "movement of the hands and fingers and body and facial motions and expressions. . . . [A] deaf person uses sign language in front of the transmitter/receiver device containing the camera. The images captured by the camera are of the finger and hand motions and of body motions and of facial expressions and motions captured by a digital device which does initial processing." (Ex. PA-1, 6:4-47; Ex. PA-DEC, ¶ 65.) For similar reasons, *Liebermann* discloses these features under the plain meanings proposed by PO and found by the district court's claim construction order. (*See infra* Section IV; CC-2.)

> e. **[1.e] a second camera oriented to view an object other than the user of the device and having a second camera output, wherein the first and second cameras include non-overlapping fields of view, and wherein the computer is adapted to perform a control function of the handheld device based on at least one of the first camera output and the second camera output.[8]**

Liebermann discloses or suggests this limitation. (Ex. PA-DEC, ¶ 66.) As discussed above in Section V.A.2.d, *Liebermann* discloses a "first camera" as claimed.   (Section V.A.2.d.) *Liebermann* further discloses that "[i]t may be **desirable to utilize more than one camera** to allow the signing person 'free' movement in his or her environment to track down spatial positions in that environment." (Ex. PA-1, 13:4-8 (emphasis added).) As such, a POSITA would have been motivated to include a second camera in a cellular telephone similar to as disclosed in *Liebermann*'s Figure 6 embodiment. (Ex. PA-DEC, ¶ 67.)

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[8] Based on the claim language of the '924 patent, the claimed "at least one of" X and Y language is in the disjunctive form. (*Compare* Ex. PAT-A, claim 1 ("perform a control function of the handheld device based on at least one of the first camera output and the second camera output") *with id.*, claim 13 ("The handheld device of claim 1 wherein the computer is adapted to perform a control function based on the first camera output and based on the second camera output.").)

For instance, *Liebermann* explains that when utilizing more than one camera, "the installation [of multiple cameras] should follow the following criteria," including, among other things, that (1) each camera is covering a separate angle, (2) each camera operates independently of the other(s), (3) angle overlap may or may not be permitted according to the pre-signing calibration, (4) integration of input from multiple camera is performed. (Ex. PA-1, 13:9-12.) Accordingly, a POSITA would have understood that a configuration with two cameras would have provided a larger field of view or multiple fields of view, with the output of the cameras integrated, for capturing the signing person's hands, finger, body movements as well as facial expressions. (Ex. PA-DEC, ¶ 68.) Indeed, *Liebermann* expressly discloses that having multiple cameras is beneficial as it would have "allow[ed] the signing person 'free' movement in his or her environment to track down spatial positions in that environment." (Ex. PA-1, 13:5-6; Ex. PA-DEC, ¶ 68)

A POSITA would have had a reasonable expectation of success in such an implementation because *Liebermann* itself expressly states that two-camera embodiments were "desirable," Ex. PA-1, 13:4-8, and provides applicable criteria for such "installation[s]," *id*., 13:9-28 ("the installation should follow the following criteria"). (Ex. PA-DEC, ¶ 69.) Similar multi-camera arrangements were explicitly recognized in the art, as a POSITA would have appreciated. (Ex. PA-DEC, ¶ 69.) For example, *Sears*[9] teaches a multiple-camera reading device, wherein the cameras sense gestures to control the device. (Ex. PA-2, Abstract, 20:65-21:16; *id.*, 22:5-8 ("[I]n these embodiments, the camera received commands, at least in part, from hand and finger gestures of the user that were captured by the camera or cameras.").) In another example, *Bushnag*[10]

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[9] *Sears* (Ex. PA-2) is cited as evidence supporting the knowledge of a POSITA before the time of the alleged invention.

[10] *Bushnag* (Ex. PA-8) is cited as evidence supporting the knowledge of a POSITA before the time of the alleged invention. *Bushnag* is a publication of a patent application laid "Open to Public Insp[ection]" (i.e., publically accessible as a printed publication) by the Canadian Intellectual Property Office on October 30, 1997. *See eBay v. MoneyCat*, CBM2014-00092, Paper 12 at 12 (P.T.A.B. Sep. 24, 2014) (crediting "Open to Public Insp." date as establishing Canadian laid-open patent application as publicly accessible printed publication) (citing *In re Wyer*, 655 F.2d 221 (C.C.P.A. 1981)); *In re Wyer*, 655 F.2d 221 (C.C.P.A. 1981); *Bruckelmyer v. Ground Heaters, Inc.*, 445 F.3d 1374 (Fed. Cir. 2006) (determining a Canadian patent application was publically accessible and thus a printed publication); *see also* Ex. PA-8, 1 (listing an October 30, 1997 date); Ex. PA-9 (listing the open to public inspection date of the *Bushnag* reference as October 30, 1997). Thus, *Bushnag* qualifies as prior art at least under pre-AIA 35 U.S.C. § 102(b).

teaches a dual camera, gesture-controlled laptop device. (Ex. PA-8, FIG. 9; *id.,* 22 (disclosing a laptop computer 70 that includes digital cameras 12 and 14); *id.*, 17 (disclosing that specific functions of the system are triggered when the cameras detect specific, unnatural eye gestures); *id.*, 13 ("Figure 9 illustrates an embodiment of the eye-controlled command system used in conjunction with a conventional portable computer.").)

Moreover, such a modification would have involved applying known technologies (e.g., known gesture detection technology and known criteria of installing multiple cameras in a device like those described in *Liebermann*) according to known methods (e.g., known multi-camera gesture detection techniques like those also described in *Liebermann*) to yield the predictable result of a cellular phone implemented with multiple cameras for use in an electronic communication system. *See KSR Intern. Co. v. Teleflex Inc.*, 550 U.S. 398, 416 (2007). Accordingly, *Liebermann* discloses or suggests a handheld device comprising "a first camera . . .; and **a second camera**." (Ex. PA-DEC, ¶ 70.)

Furthermore, *Liebermann* discloses or suggests that the "second camera" is "oriented to view an object other than the user of the device." For example, in the configuration of *Liebermann* discussed above where multiple cameras (including the "second camera") are used, the multiple cameras are positioned at different angles and may be used to define "any objects" or "alive, stationary or moving entities, such as animals" as well as to interpret the signing motions of multiple "person(s)." (Ex. PA-1, 13:4-16; *see also* Ex. PAT-A, 3:53-54 (describing that "objects" include "persons"); Ex. PA-DEC, ¶ 71.) Thus, the additional cameras are oriented to view "an object other than the user of the device," as claimed. Moreover, *Liebermann* also discloses that a camera may recognize special gloves ("an object other than the user of the device") and gestures depicted by the glove. (Ex. PA-1, 12:40-43, 13:4-16.) For this additional reason, *Liebermann* discloses or suggests that "a second camera oriented to view an object other than the user of the device." (Ex. PA-DEC, ¶71.) For similar reasons, *Liebermann* discloses or suggests that the second camera is "oriented to view" an object other than the user of the device under Requester's construction discussed above. (Ex. PA-DEC, ¶ 71; *supra* Section IV.A.) In particular, because *Liebermann*'s "second camera" defines or recognizes various objects or persons (either of which being "an object other than the user of the device") as well as their signing motions (*see*, *e.g.*, Ex. PA-1, 12:40-43, 13:4-16), *Liebermann*'s "second camera" has to have "a field of view encompassing" these "object[s]." (Ex. PA-DEC, ¶ 71.)   Accordingly, *Liebermann* discloses or

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suggests this limitation under the Requester's proposed constructions, and the plain meaning proposed by PO and found by the district court. (*See infra* Section IV; Ex. CC-2.)

The "second camera" disclosed by *Liebermann* includes "a second camera output" as claimed. (Ex. PA-DEC, ¶ 72.) For example, *Liebermann* discloses that an input is provided from its second camera, which as a POSITA would have understood, corresponds to the claimed "second camera output." (Ex. PA-1, 13:4-16 ("Integration of input from multiple camera is performed."); Ex. PA-DEC, ¶ 72.) *Liebermann* also discloses that "the first and second cameras include non-overlapping fields of view." (Ex. PA-DEC, ¶ 72.) For example, *Liebermann* discloses that each of the multiple cameras (including the first camera) "**cover[s] a separate angle**," Ex. PA-1, 13:11, and the cameras may not have angle overlap, *id.*, 13:13-14 ("Angle overlap may or may not be permitted according to the pre-signing calibration."). That is, the two cameras may have: (1) some overlap in FOV, but also include non-overlapping FOVs; or (2) no overlap in their FOVs. (*Id.*, 13:4-14.) Accordingly, *Liebermann* discloses "a second camera oriented to view an object other than the user of the device and having a second camera output, wherein the first and second cameras include non-overlapping fields of view." (Ex. PA-DEC, ¶ 72.)

Liebermann also discloses that "the computer is adapted to perform a control function of the handheld device based on at least one of the first camera output and the second camera output." (Ex. PA-DEC, ¶ 73.) With respect to this claimed feature, the '924 patent discloses that a control function of a handheld device includes controlling the device "itself" to perform a function, e.g., a base function of the device or a method to interact with the device to achieve other purposes. (Ex. PAT-A, 11:65-12:3 (emphasis added) ("FIG. 8A illustrates control of functions with the invention, using **a handheld device which *itself* has functions** (for example, a cell phone). The purpose is to add functionality to the device, without complicating its **base function**, and/or alternatively **add a method to interact with the device to achieve other purposes**.").)

Liebermann discloses that the phone performs initial processing based on the camera images and also discloses that the phone screen is controlled to display the "text of what was signed." (Ex. PA-1, 6:30-52, FIG. 8 (showing at the bottom of the figure that the phone displays "text of what was signed").)

TELEPHONE FOR THE DEAF VIDEO MONITOR SCREEN LAYOUT
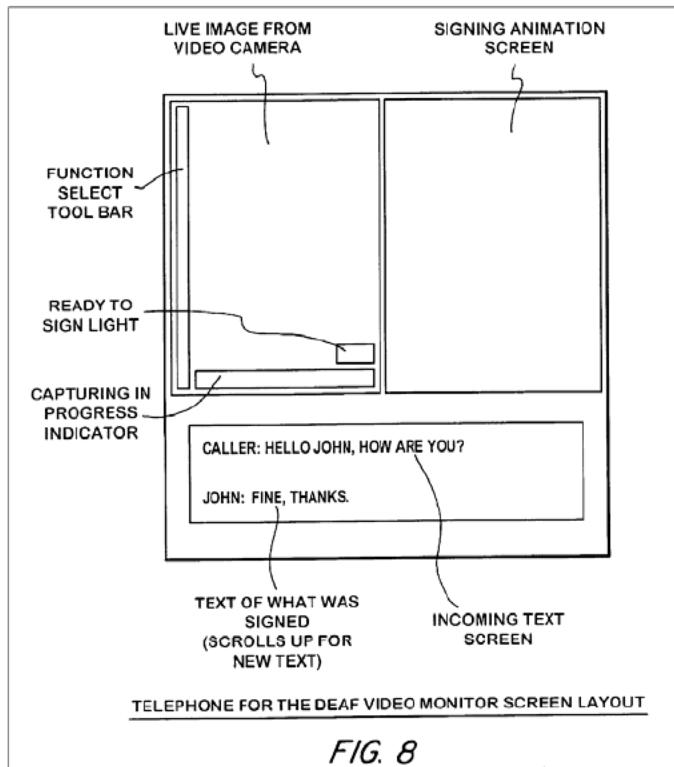
FIG. 8

(*Id.*, FIG. 8.) *Liebermann* discloses a computer for the reasons explained for limitation [1.c] above.

A POSITA would have understood that *Liebermann*'s in-phone computer (which drives the display, performs initial processing of camera images, etc., *supra* Section V.A.2.c) is adapted to **control the text that is displayed** based on **what was signed**. (Ex. PA-1, 6:30-52, FIG. 8; Ex. PA-DEC, ¶ 74.) Consistent with the '924 patent (Ex. PAT-A, 11:65-13:26 (disclosing that the "function" controlled may be a "base function" of the device)), displaying text is a base function of the cellular telephone in *Liebermann*. (Ex. PA-DEC, ¶ 74.) Because **what text to display** is controlled based on the output of the at least one of *Liebermann*'s cameras associated with the signs/gestures, Ex. PA-1, FIG. 8, 6:30-52, *Liebermann* discloses "the computer is adapted to perform a control function of the handheld device based on at least one of the first camera output and the second camera output." To the extent performing a control function of the handheld device "based on at least one of the first camera output and the second camera output" requires performing a display function based on one image as opposed to two or more images (it does not—the claim does not make such a specific distinction and only requires the system to perform a control function based on at least one camera output), *Liebermann* explains that a single sign (and corresponding word in the text that is displayed) may correlate with a single image frame. (*See id.*, 6:30-57, 7:19-21, FIG. 8.) For instance, "[t]he camera in **the cellular phone transmits the image** for initial

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processing in the cellular phone." (*Id.*, 7:19-21.) This image is transmitted as data to the center wherein "[t]he rest of the processing is completed at the center. This includes identification of the letters, numbers and words, conversion to standard sign language." (*Id.*, 6:40-57.) That is, a POSITA would have understood that an image may be translated to a letter, number or word in accordance with sign language, *id.*, and accordingly displayed on the cellular telephone as claimed, *id.*, FIG. 8.

Liebermann's telephone computer also allows a user to interact with the device to achieve the purpose of sign language calling communication ("the computer is adapted to perform a control function of the handheld device") based on the camera outputs associated with the signs/gestures. (Ex. PA-1, FIG. 8, 5:62-6:14, 6:53-59.) *Liebermann* for this additional reason discloses that "the computer is adapted to perform a control function of the handheld device based on at least one of the first camera output and the second camera output," as the '924 patent discloses that the "function" controlled may be "a method to interact with the device to achieve other purposes." (Ex. PAT-A, 11:65-12:3; Ex. PA-DEC, ¶ 76.)

Liebermann discloses that the claimed "computer is adapted to" perform identified functions under Requester's construction discussed above, i.e., software running on a computer that is programmed to perform the claimed function or equivalents thereof. (*See supra* Section IV.B, D; Ex. PA-DEC, ¶ 77.) For example, *Liebermann* discloses that the applicable cellular telephone hardware—which a POSITA would have understood as a computer—runs "software" and performs the initial processing required to control what text to display based on the camera output associated with the signs/gestures. (Ex. PA-1, 6:40-52, 7:10-49; Ex. PA-DEC, ¶ 77.) Indeed, *Liebermann* explains that the disclosed device includes "processing hardware and software" required to operate the cellular telephone. (Ex. PA-1, 13:40-66; Ex. PA-DEC, ¶ 77.) Thus, as a POSITA would have understood, *Liebermann*'s cellular telephone computer is programmed with software to perform the various functions, including the claimed "perform[ing] a control function of the handheld device based on at least one of the first camera output and the second camera output." (Ex. PA-DEC, ¶ 77.) Accordingly, *Liebermann* discloses the claimed "computer" that is "adapted to" perform the identified functions under Requester's construction. (Ex. PA-DEC, ¶ 77.) Thus, *Liebermann* discloses or suggests this limitation under both the Requester's proposed constructions, and the plain meaning proposed by PO and found by the district court. (*See infra* Section IV; Ex. CC-2.)

3.   Claim 2

  a.   **The handheld device of claim 1 wherein the handheld device comprises a mobile phone.**

Liebermann discloses this limitation. (Ex. PA-DEC, ¶ 78.) For example, *Liebermann* discloses that the handheld device disclosed in the context of FIG. 6 is a "cellular telephone." (Ex. PA-1, 4:20-21.)
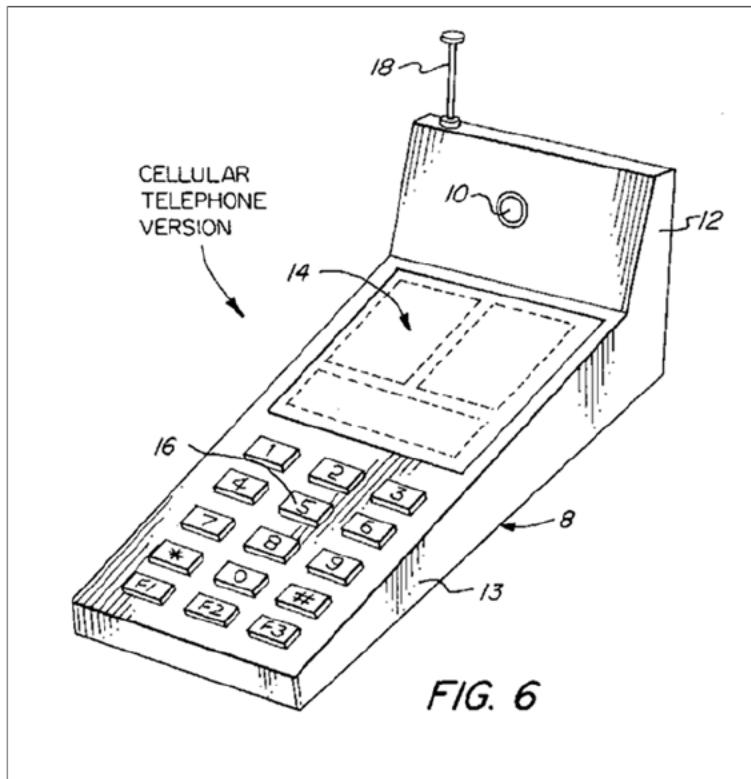
FIG. 6

(*Id.*, FIG. 6.)

4.   Claim 3

  a.   **The handheld device of claim 1 wherein the first camera is adapted to acquire an image of at least a portion of the user.**

Liebermann discloses this limitation. (Ex. PA-DEC, ¶ 79.) As discussed in claim element 1[d], *Liebermann* discloses a "first camera" is oriented to view a user of the device to detect sign

language gestures. (*Supra* Section V.A.2.d.) Furthermore, *Liebermann* discloses that the first camera "record[s] the signing movement of the hands and fingers and body and facial motions and expressions," where "[a] deaf person uses sign language in front of the transmitter/receiver device containing the camera" and "[t]he **images captured by the camera are of the finger and hand motions and of body motions and of facial expressions** and motions captured by a digital device which does initial processing." (Ex. PA-1, 6:4-47 (emphasis added); *see also id.*, 4:60-62 ("the deaf person uses sign language in front of a device containing a video camera.").) Moreover, *Liebermann* likewise discloses the claimed limitation under Requester's construction, where that the first camera is "designed to" acquire an image of at least a portion of the user for similar reasons described above. (Ex. PA-DEC, ¶ 80.) Thus, *Liebermann* discloses this limitation under both the Requester's proposed constructions, and the plain meaning proposed by PO and found by the district court. (*See supra* Section IV; Ex. CC-2.)

5. Claim 4

a. The handheld device of claim 1 wherein the second camera is adapted to acquire an image of the object.

Liebermann discloses this limitation. (Ex. PA-DEC, ¶ 82.) As discussed above, *Liebermann* discloses that the multiple cameras (including the "second camera") may be used to define "any objects" or "alive, stationary or moving entities, such as animals" as well as to interpret the signing motions of multiple "person(s)." (*Supra* Section V.A.2.e; Ex. PA-1, 13:4-16; *see also* Ex. PAT-A, 3:53-54; Ex. PA-DEC, ¶ 83.) Furthermore, *Liebermann* discloses that "[i]ntegration of input from multiple camera is performed." (Ex. PA-1, 13:4-16.) A POSITA would have understood that, in the context of *Liebermann*'s disclosure, *Liebermann*'s "second camera" is adapted to acquire an image of the object in order to perform the above noted processes associated with the second camera (e.g., defining any objects as well as to interpret the signing motions of multiple "person(s)"). This is particularly true given that *Liebermann* performs an "initial processing" that involves processing "each of the frames containing a captured image." (*Id.*, 6:47-48.) Thus, *Liebermann* discloses this limitation. (Ex. PA-DEC, ¶ 83.) Moreover, *Liebermann* likewise discloses the claimed limitation under Requester's construction, where that the second camera is "designed" to acquire an image of the object for similar reasons described above. (Ex. PA-DEC, ¶ 83.) Thus, *Liebermann* discloses this limitation under both the Requester's proposed

constructions, and the plain meaning proposed by PO and found by the district court. (*See supra* Section IV; Ex. CC-2.)

6.   Claim 5

   a.   **The handheld device of claim 1 wherein the second camera is adapted to acquire a video of the object.**

Liebermann discloses or suggests this limitation. (Ex. PA-DEC, ¶ 85.) As a backdrop, *Liebermann* discloses that the first camera of the cellular telephone is a video camera. (Ex. PA-1, 13:4-8 ("The illustrated embodiments all utilize a single video cameras").) As discussed above, the second camera of the cellular telephone is oriented to view an object. (*Supra* Section V.A.2.e.) A POSITA would have understood that when *Liebermann* refers to utilizing more than one camera, as compared to embodiments that "all utilize a *single video camera*," it refers to utilizing multiple *video* cameras. (Ex. PA-1, 13:4-8; Ex. PA-DEC, ¶ 86.) For instance, *Liebermann* discloses that the additional camera (e.g., the claimed "second camera") would "allow the signing person 'free' movement in his or her environment to track down spatial positions in that environment." (Ex. PA-1, 13:4-8; Ex. PA-DEC, ¶ 86.) As such, a POSITA would have understood that the second camera, like the first camera, is a video camera that can detect gestures and can increase the field of view a user could sign. (Ex. PA-1, 13:4-8; *id.*, 5:62-65, 13:29-31 (use of multiple "three dimensional video cameras"); Ex. PA-DEC, ¶ 86.) Thus, *Liebermann* discloses this limitation. (Ex. PA-DEC, ¶ 86.) Moreover, *Liebermann* likewise discloses the claimed limitation under Requester's construction, where that the second camera is "designed" to acquire a video of the object for similar reasons described above. (Ex. PA-DEC, ¶ 86.)   Thus, *Liebermann* discloses or suggests this limitation under both the Requester's proposed constructions, and the plain meaning proposed by PO and found by the district court. (*See supra* Section IV; Ex. CC-2.)

7.   Claim 13

   a.   **The handheld device of claim 1 wherein the computer is adapted to perform a control function based on the first camera output and based on the second camera output.**

Liebermann discloses this limitation. (Ex. PA-DEC, ¶ 89.) As discussed above for claim 1, *Liebermann* discloses a two-camera system where each camera has a respective camera output. (*Supra* Section V.A.2.)   The outputs of the cameras are "integrat[ed]," and gesture data is "integrated into a single observable signing" and/or "[s]igning content." (Ex. PA-1, 13:4-21, 7:49-8:26; Ex. PA-DEC, ¶ 90.)   As such, the system is capable of detecting gestures when the user moves across multiple cameras' fields of view (the "first camera" and the "second camera" fields of view) when making signs. (Ex. PA-1, 13:4-21 (disclosing "utilize[ing] more than one camera to allow the signing person 'free' movement in his or her environment"); Ex. PA-DEC, ¶ 90.)   Furthermore, as discussed in Section V.A.2.e, *Liebermann* discloses that the cellular phone computer (discussed above for limitation [1.c]) is adapted to **control what text to display** based on the **text of what was signed**. (Ex. PA-1, 6:30-52, FIG. 8; Ex. PA-DEC, ¶ 90.)   As discussed, *Liebermann* discloses that the output of the two cameras is integrated and the cameras (i.e., both cameras) capture signing/gesture motions. (*Supra* Section V.A.2.e.)   Accordingly, *Liebermann* discloses that the "computer is adapted to perform a control function based on the first camera output and based on the second camera output." (Ex. PA-DEC, ¶ 90.)   Moreover, *Liebermann* likewise discloses that "the computer is adapted to perform" the claimed control function under Requester's construction discussed above, i.e., software running on a computer that is programmed to perform the claimed function or equivalents thereof. (*Supra* Section IV.B, D; Ex. PA-DEC, ¶ 90.)   For example, as discussed in Section V.A.2.e, *Liebermann* discloses that its computer runs "software" and performs the initial processing required to control what text to display based on the camera output associated with the signs/gestures, Ex. PA-1, 6:40-52, 7:10-49, and that the disclosed device includes "processing hardware and software" required to operate the cellular telephone, *id.*, 13:40-66. (Ex. PA-DEC, ¶ 90.)   Thus, *Liebermann* discloses this limitation under both the Requester's proposed constructions, and the plain meaning proposed by PO and found by the district court. (*See supra* Section IV; Ex. CC-2.)

B.   SNQ2: *Liebermann* in view of *Tryding*

As explained below and in the attached declaration of Dr. Abowd (Ex. PA-DEC), *Liebermann* and *Tryding* disclose or suggest the limitations of claim 11 of the '924 patent. (Ex. PA-DEC, ¶ 91.)

1.   Overview of *Tryding*

Tryding relates to user interfaces for mobile telephones, and more particularly, using a portable computer to control a display. (Ex. PA-7, 1:8-11 "The present invention relates to user interfaces for mobile telephones, and more particularly, to the display of data associated with the mobile telephone display on an external electronic display.").) Thus, *Tryding* is in the same or similar technical field as *Liebermann* and the '924 patent, and a POSITA would have had reason to consider the teachings of *Tryding* when implementing the *Liebermann* system. (*Supra* Section V.A; Ex. PA-DEC, ¶ 46.) To the extent *Tryding* is not within the field of endeavor of the '924 patent (it is), *Tryding* is reasonably pertinent to problems associated with displaying data when portable devices were becoming smaller and smaller, a problem with which the inventor was involved. (Ex. PA-7, 1:28-33 (discussing a problem with producing "smaller and smaller hand-held units" is displaying the data); Ex. PAT-A, 26:4-15 (discussing problems of displaying data in light of "the computers smaller trend"); Ex. PA-DEC, ¶ 46.)

2.   Claim 11

a.   The handheld device of claim 1 wherein the computer is adapted to generate control instructions for a display that is separate from the handheld device.

As discussed above in Section V.A.2, *Liebermann* discloses the handheld device of claim 1 and that the computer controls the cellular phone to display data, communicate information, etc. (*supra* Section V.A.2), however, *Liebermann* does not explicitly disclose that "the computer is adapted to generate control instructions for a display that is separate from the handheld device." Nevertheless, it would have been obvious to implement these features in view of *Tryding*. (Ex. PA-DEC, ¶ 92.)

Tryding discloses a mobile telephone that "generate[s] control instructions for a display that is separate from [a] handheld device." *Tryding*, like *Liebermann*, discloses a "mobile telephone" 10. (Ex. PA-7, 2:27-31.) It additionally discloses a "display monitor" 15 that is separate from mobile device 10 ("a display that is separate from [a] handheld device). (*Id.*, 2:38-44.)
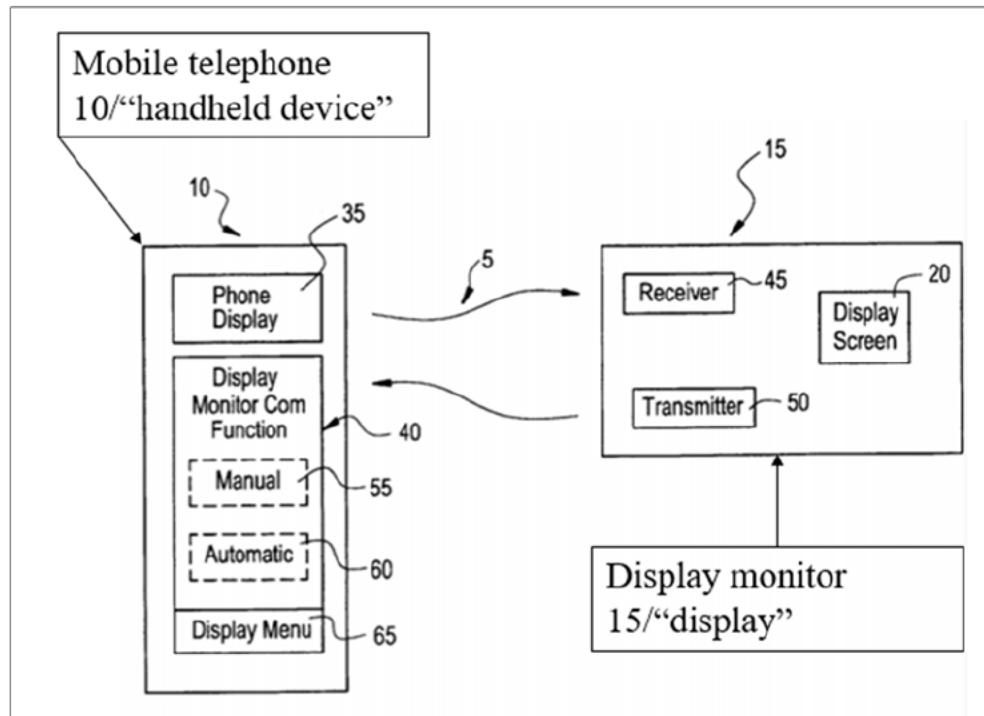
(*Id.*, FIG. 1 (annotated).)

Tryding explains that "[t]he mobile telephone 10 includes a display monitor communications function 40 enabling the generation of the communications link 5 with the monitor 15." (*Id.*, 2:39-41.) Through this link, the mobile telephone 10 sends "commands" ("control instructions") to monitor 15 to control what is displayed on remote monitor 15. (*Id.*, 3:17-47; Ex. PA-DEC, ¶ 94.) For example, the cell phone commands can cause the remote display 15 to show "menu text 80, SMS menu text 85, all text 90, and incoming call data 95." (Ex. PA-7, 3:17-33.)
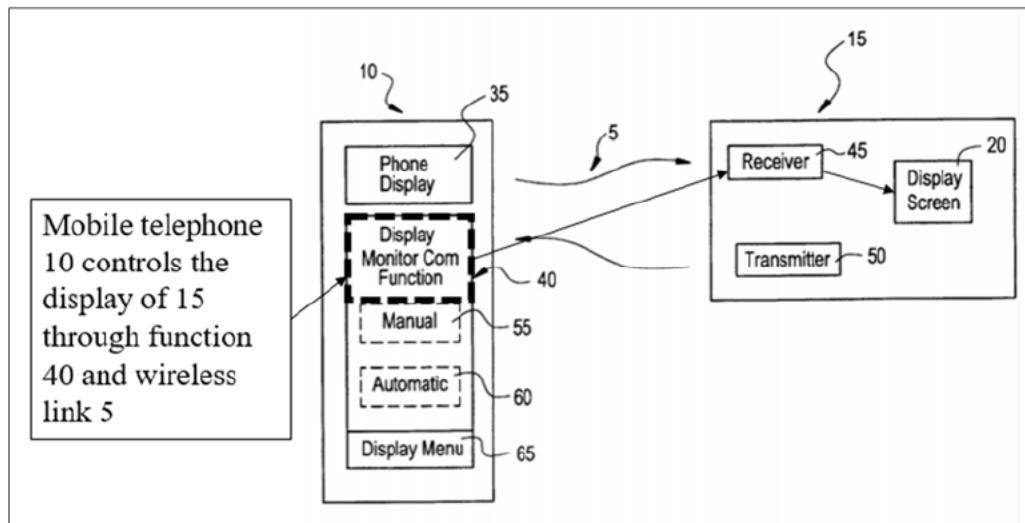
(*Id.*, FIG. 1 (annotated excerpt); *id.*, 2:27-51.)

In light of *Tryding*'s disclosures, a POSITA would have been motivated to include a display that is separate from a handheld device when implementing the handheld device similar to as disclosed in *Liebermann*, where the computer of the handheld device is adapted to generate control instructions for the display. (Ex. PA-DEC, ¶ 95.) For instance, *Tryding* explains that because "the small size of the mobile telephones necessarily causes an associated display to be rather small," "use of small font characters or abbreviations" may be required to "fully present visual information to the user of the cellular telephone." (Ex. PA-7, 1:23-27; *see also id.*, 1:8-33.) However, such configuration "makes the displayed data difficult to read or interpret." (*Id.*, 1:28-30.) As such, a POSITA would have understood that using a separate display similar to as disclosed in *Tryding* (which is controlled by the handheld device, e.g., controlling what to present on the separate display) would have been beneficial. (Ex. PA-DEC, ¶ 95.) This is because, for example, a separate display, which may be made relatively larger compared to the display on the handheld device (e.g., *Liebermann*'s cellular phone), would have been able to present the data at a size that makes it easier for a user to read. (Ex. PA-DEC, ¶ 95.)

A POSITA would have had a reasonable expectation of success when implementing the above-described configuration. (Ex. PA-DEC, ¶ 96.) Indeed, *Tryding* expressly discloses how to control and communicate with a separate display using a handheld device, e.g., by the use of "a display monitor communications function 40" that enables the generation of the communication link 5 with the monitor 15. (Ex. PA-7, 2:39-40; *see also id.*, 2:52-61 (explaining that the communication link 5 is based on known communication technology, e.g., infrared communication link or RF communications).) A POSITA would have understood that functions and configurations to control the separate display (e.g., display monitor communications function 40 as disclosed in *Tryding*) would have been implemented in *Liebermann*'s computer based on software programming, particularly when *Liebermann* already discloses using software in the device to perform various functions. (Ex. PA-1, 6:40-52, 7:10-49; *id.*, 13:40-66 (disclosing that the device includes "processing hardware and software" required to operate the cellular telephone).) Such configuration would have involved a combination of known technologies (e.g., as in *Liebermann* and *Tryding*) according to known methods (e.g., known processes to control a separate display) to yield a predictable result, where a computer of a handheld device is adapted to generate control instructions for a display that is separate from the handheld device. *See KSR*

*Intern. Co. v. Teleflex Inc.*, 550 U.S. 398, 416 (2007). Accordingly, the *Liebermann-Tryding* combination discloses and/or suggests this limitation. (Ex. PA-DEC, ¶ 96.) Moreover, *Liebermann* likewise discloses that "the computer is adapted to perform" the claimed control function under Requester's construction discussed above, i.e., software running on a computer that is programmed to perform the claimed function or equivalents thereof, for the same reasons and as discussed above in *supra* Section V.A.2.e. (*Supra* Section V.A.2.e (explaining how the *Liebermann* cellular telephone computer is programmed with software to operate).) Thus, *Liebermann-Tryding* discloses or suggests this limitation under both the Requester's proposed constructions, and the plain meaning proposed by PO and found by the district court. (*See supra* Section IV; Ex. CC-2.)

C.   SNQ3: *Liebermann* in view of *Gershman*

As explained below and in the attached declaration of Dr. Abowd (Ex. PA-DEC), *Liebermann* and *Gershman* disclose or suggest the limitations of claim 14 of the '924 patent. (Ex. PA-DEC, ¶ 93.)

1.   Overview of *Gershman*

Gershman relates to mobile telephones and display systems, and more particularly, using a mobile phone to connect to the internet. (Ex. PA-5, 1:35-40 "The present invention relates to agent based systems and more particularly to a mobile computing environment that accesses the Internet . . . ."); *id.*, Abstract ("A system is disclosed that facilitates web-based information retrieval and display system. A wireless phone or similar hand-held wireless device with Internet Protocol capability is combined with other peripherals to provide a portable portal into the Internet.").) Thus, *Gershman* is in the same or similar technical field as *Liebermann* and the '924 patent, and a POSITA would have had reason to consider the teachings of *Gershman* when implementing the *Liebermann* system. (*Supra* Section V.A; Ex. PA-DEC, ¶ 47.) To the extent *Gershman* is not within the field of endeavor of the '924 patent (it is), *Gershman* is reasonably pertinent to problems associated with increasing mobile computing applications and/or communicating targeted information. (Ex. PA-5, 2:50-3:11; Ex. PAT-A, 23:38-42 ("The invention provides . . . all of the benefits of the video and computer revolution, also via the internet."); Ex. PA-DEC, ¶ 47.)

2.   Claim 14

       a.   **The handheld device of claim 1 wherein the computer is adapted to transmit information over an internet connection.**

While not expressly disclosed by *Liebermann*, a POSITA would have found it obvious to adapt a computer of a cellular telephone (such as the *Liebermann* computer) to transmit information over an internet connection in view of *Gershman*. (Ex. PA-DEC, ¶ 97.) *Gershman* discloses a wireless phone having a computer that is adapted to transmit information over an internet connection. (Ex. PA-DEC, ¶ 98.) In particular, *Gershman* discloses that wireless phones were known to be connected to the Internet before the time of invention, e.g., the Nokia 9000 is capable of "access[ing] information through the World Wide Web." (Ex. PA-5, 2:1-18, FIG. 1A (showing a mobile phone that connects to Internet Service Provider 12 and a phone company 22); *id.*, 1:62-2:35 (discussing "wireless phones" that had web browsers and mobile computing solutions that "utilize an Internet service provider (ISP) 12 to gain access to a web portal 14" and connect to a phone company 22).)

A POSITA would have been motivated to include internet access capability when implementing a cellular phone similar to as disclosed in *Liebermann* such that the computer in the cellular phone is adapted to transmit information over the internet connection. (Ex. PA-DEC, ¶ 99.) A POSITA would have understood connecting the cellular telephone computer to the internet would "permit a user to access vast amounts of information and services without, essentially, geographical boundaries." (Ex. PA-5, 2:66-3:2.) Moreover, connecting the computer to the internet similar to as described in *Gershman* would increase user convenience and provide a "rich environment to perform a large number of tasks on behalf of the user." (*Id.*, 3:2-4.) For instance, *Gershman* discloses that "a software agent" may perform a large number of tasks for the user, e.g., the software agent "could scan the Internet and obtain information ranging from the latest sports news to a particular graduate thesis in applied physics." (*Id.*, 2:61-3:9; *see also id.*, 43:55-60 ("A Personal Digital Assistant (PDA) with Internet access can synchronize the person's calendar, email, contact list, task list and notes on the PDA with the version stored in the Internet site.").) As such, a POSITA would have been motivated to implement a cellular phone computer (similar to as disclosed in *Lieberman*)*, e.g., by including a software agent (like that of *Gershman*) such that the computer is adapted to transmit information over an internet connection. (Ex. PA-DEC, ¶ 99.) Further, persons of ordinary skill in the art understood that consumers wanted devices that could

connect to the internet before the time of invention and would have been motivated to include the claimed internet feature for similar reasons. (Ex. PA-DEC, ¶ 99.) Indeed, such a skilled person would have been motivated to include an internet connection at least because it could conveniently and quickly communicate various data on demand. (Ex. PA-DEC, ¶ 99.)

A POSITA would have had a reasonable expectation of success in implementing the internet access in a cellular phone computer. (Ex. PA-DEC, ¶ 100.) Such an implementation was well-known at the time of invention. For example, the Nokia 9000 phone is capable of "access[ing] information through the World Wide Web." (Ex. PA-5, 2:1-18.) Furthermore, such an implementation would have involved a combination of known technologies (e.g., as in *Liebermann* and *Gershman*) according to known methods (e.g., known processes to transmit information over the Internet) to yield a predictable cell phone computer that is adapted to transmit information over an internet connection. (Ex. PA-DEC, ¶ 100.) *See KSR Intern. Co. v. Teleflex Inc.*, 550 U.S. 398, 416 (2007). Accordingly, the *Liebermann-Gershman* combination discloses and/or suggests this limitation. (Ex. PA-DEC, ¶ 100.).

Moreover, the *Liebermann-Gershman* combination likewise discloses that "the computer is adapted to perform" the claimed control function under Requester's construction discussed above, i.e., software running on a computer that is programmed to perform the claimed function or equivalents thereof, for the same reasons and as discussed above in *supra* Section V.A.2.e. (*Supra* Section V.A.2.e (explaining how the *Liebermann* cellular telephone computer is programmed with software to operate); Ex. PA-DEC, ¶ 101.) Thus, *Liebermann-Gershman* discloses or suggests this limitation under both the Requester's proposed constructions, and the plain meaning proposed by PO and found by the district court. (*See supra* Section IV; Ex. CC-2.)

D.   SNQ4: *Liebermann* in view of *Himmel*

As explained below and in the attached declaration of Dr. Abowd (Ex. PA-DEC), *Liebermann* and *Himmel* disclose or suggest the limitations of claims 1-8, 10, and 12-13 of the '924 patent. (Ex. PA-DEC, ¶ 102.)

1.   Overview of *Himmel*

Himmel relates to processing data on mobile telephones. (Ex. PA-3, 1:15-16 ("The present invention relates generally to an improved data processing system . . . ."); *id.*, 5:19-21 (In "FIG. 3, a block diagram of a wireless phone computing platform is depicted in accordance with a preferred

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embodiment of the present invention.").) Thus, *Himmel* is in the same or similar technical field as *Liebermann* and the '924 patent, and a POSITA would have had reason to consider the teachings of *Himmel* when implementing the *Liebermann* system. (*Supra* Section V.A; Ex. PAT-A, 11:64-12:3 ("FIG. 8A illustrates control of functions with the invention, using a handheld device which itself has functions (for example, a cell phone). The purpose is to add functionality to the device, without complicating its base function, and/or alternatively add a method to interact with the device to achieve other purposes."); Ex. PA-DEC, ¶ 48.) To the extent *Himmel* is not within the field of endeavor of the '924 patent (it is), *Himmel* is reasonably pertinent to problems associated with mobile computing and its applications. (Ex. PA-3, 1:15-16 ("The present invention relates generally to an improved data processing system."); *id.*, 5:19-21 (disclosing "a wireless phone computing platform"); Ex. PAT-A, 23:38-42 ("The invention provides . . . all of the benefits of the video and computer revolution."); Ex. PA-DEC, ¶ 48.)

> **2.   Claim 1**

>> **a.   [1.a] A handheld device comprising:**

To the extent the preamble is limiting, *Liebermann* discloses this limitation for the reasons discussed *supra* in Section V.A.2.a.

>> **b.   [1.b] a housing;**

Liebermann discloses and/or suggests this limitation for the reasons discussed *supra* in Section V.A.2.b.

>> **c.   [1.c] a computer within the housing;**

While *Liebermann* discloses that the cellular telephone performs "initial processing" and populates a phone display, among other things, *supra* Section V.A.2.c; Ex. PA-1, 5:62-6:10, 6:40-52, FIG. 8, it also discloses that aspects of gesture recognition occur on a network server, Ex. PA-1, 6:41-63, FIG. 1. To the extent *Liebermann* does not explicitly disclose a computer within the housing of the cellular telephone, this feature would have been obvious. (Ex. PA-DEC, ¶ 105.) For example, it would have been obvious to perform all processing steps, including the initial processing and the gesture recognition process, locally on a computer of the cellular telephone. (Ex. PA-DEC, ¶ 105.)

In *Liebermann*, the cellular telephone performs initial gesture processing but uses a network computer to perform the rest of the gesture recognition process. (Ex. PA-1, 6:41-63; Ex.

PA-DEC, ¶ 106.)   The *Liebermann* communication system converts sign language gestures to speech that can be transmitted to a person on the other side of a call. (Ex. PA-1, FIG. 1; *id.*, 12:30-36 (referring to hand signs as "gesture[s]").)   To do so, at least one camera of a cellular telephone records a user making hand sign gestures. (*Id.*, 5:62-6:9 (describing how the cellular telephone camera records the signing movement of user hands); *id.*, 13:4-16 (teaching a two-camera embodiment); *id.*, FIG. 6.)   After performing "initial processing" to collapse gesture images into small sets of fixed identifiers, the cellular telephone outsources a networked computer to determine which hand gestures a user makes. (*Id.*, 6:41-63 (describing how a network data processing center identifies signing movements to convert the signs to text); *id.*, 12:30-36 (referring to hand signs as "gesture[s]"); Ex. PA-DEC, ¶ 106.)
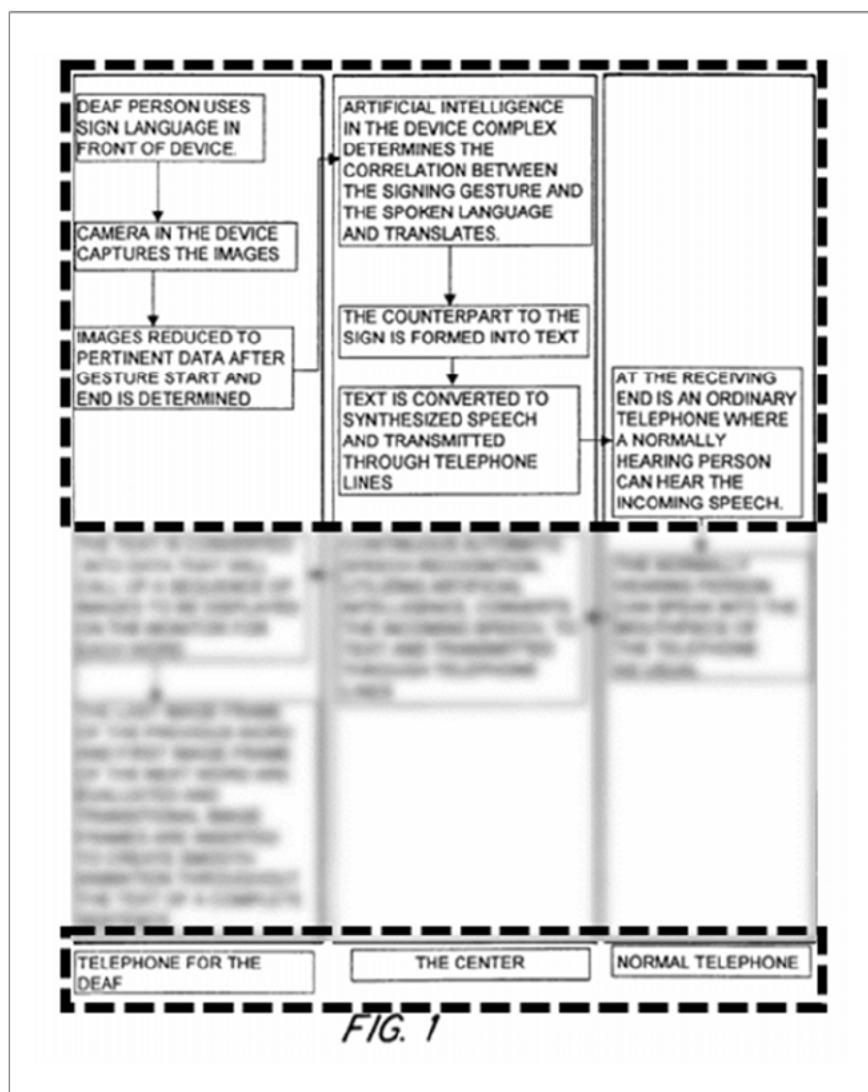
FIG. 1

(*Id.*, FIG. 1 (annotated and blurred for emphasis) (disclosing a telephone for the deaf that captures images of hand sign gestures and a center computer that determines what hand sign gestures were made).)

It would have been obvious to process camera outputs locally within a cellular telephone computer instead of at the networked computer. (Ex. PA-DEC, ¶ 107.) *See In re Yufa*, 452 F. App'x. 998, 1001 (Fed. Cir. 2012) (citing *KSR Intern. Co. v. Teleflex Inc.*, 550 U.S. 398, 417 (2007)) (affirming obviousness because the prior art disclosed "every element of the claims except" the location for "the processing of" data, which was "nothing more than a reconfiguration of a known system"). Indeed, *Liebermann* itself suggests that the location where processing occurs is a matter of design choice. Specifically, *Liebermann* discloses that it uses a network computer to process gesture information because it is "economic[]" to do so. (Ex. PA-1, 6:10-12; *see also id.*, 3:38-42 ("From cost and portability standpoints, the translating means is at a remote location or central station.").) While a network computer was an economic solution envisioned by *Liebermann*, *id.*, 6:10-12, a POSITA would have understood that other processing options were also available, and that there would have been reasons motivating such alternatives. (Ex. PA-DEC, ¶ 107.)

Before the time of invention, POSITAs understood that smart phones with computer units were handling a variety of sophisticated processing tasks. (Ex. PA-3, 5:18-29, FIG. 3) For example, *Himmel* discloses a "smart phone" that included an Intel "Pentium" processing unit 302 (a "computer"). (*Id.*, 5:18-29, FIG. 3.) The processor is "located within a cell phone." (*Id.*) Thus, *Himmel* discloses "a computer within the housing," as claimed. (*Id.*, 5:20-22; Ex. PA-DEC, ¶ 108.) The "computer" disclosed in *Himmel* is of a small form factor that is capable of running a Windows operating system and performing a variety of complex processes, such as processing voice commands, electronic documents, display information, etc. (Ex. PA-3, 5:42-63, FIG. 3.) A POSITA would have understood that *Himmel*'s computer, as integrated in the smart phone, like others at the time of the alleged invention, was "capable of running a variety of application software packages," such as text and/or image editors, web browsers, calculators, and others at the time of invention. (Ex. PA-4, 1:12-24, 8:2-6; *see also* Ex. PA-5, 1:43-2:18 (citing the Nokia 9000 as a smart phone that included a small keyboard, a specialized web browser, and a small VGA monitor); Ex. PA-DEC, ¶ 108.) Indeed, at the time of the alleged invention, it was known that "[m]obile computing technology. . . allow[s] the individual to access computer related information

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at all times and in all environments." (Ex. PA-5, 1:44-48.) For instance, a mobile computer of, e.g., "[a] PDA allowed a user to access computer related information, yet fitted in the palm of the hand." (*Id.*, 1:49-50.) Furthermore, a POSITA would have understood that "**more integration in mobile computing is desired**." (*Id.*, 2:3-4 (emphasis added); Ex. PA-DEC, ¶ 108.) "By utilizing computer technology, users or callers have access to computing functions and resources in a personal, portable device." (Ex. PA-3, 1:24-27.) Additionally, at the time of the alleged invention, it was known to "integrat[e] . . . personal computer technology into phones." (*Id.*, 1:22-24.) In this fashion, a POSITA would have understood that, at the time of the alleged invention, smart phones may at least have possessed processing/computing capability of personal computers. (Ex. PA-DEC, ¶ 108.)

The '924 patent does not disclose anything critical about the claimed "computer within the housing." (Ex. PA-DEC, ¶ 109.) Indeed, the '924 patent admits that the alleged invention "uses single or multiple TV cameras whose output is analyzed and used as input to a computer, such as a home PC." (Ex. PAT-A, 2:20-23; *see also id.*, 3:32-34 (disclosing use of "PC computer")．) The '924 patent even identified that an Intel Pentium processor that was widely used in a personal computer (like the Intel Pentium processor used in *Himmel*'s smart phone) was capable of executing software for performing the claimed features, e.g., recognizing various poses and gestures in images. (*Id.*, 3:29-34 (disclosing use of "PC computer 106 (integrated in this case into the monitor housing), for example a 400 Mhz Pentium II"); Ex. PAT-C, 6:6-19 (discussing that an "Intel Pentium 2" processor was suitable to execute pose analysis software and analyze when a user made a specific pose).) Thus, a POSITA would have similarly understood that the computing capacity of the Intel Pentium processor used in the *Himmel* smart phone would have provided a cellular telephone, similar to as discussed in *Liebermann*, the capability of performing various claimed features, e.g., "perform[ing] a control function of the handheld device based on at least one of the first camera output and the second camera output." (*Infra* Section V.D.2.e; Ex. PA-DEC, ¶ 109.)

A POSITA would have found it obvious to include a computer, similar to as disclosed in *Himmel*, within the housing to perform local image processing and gesture recognition when implementing a cellular telephone similar to as disclosed in *Liebermann*. (Ex. PA-DEC, ¶ 110.) As a POSITA would have understood, performing the process sign translation or gesture recognition at a remote server was no more than a design choice based on an economic decision.

(Ex. PA-1, 6:10-12.)   While the proposed modification may have required more expensive hardware, a POSITA would have appreciated that customers desired highly-integrated smart phone devices that could perform additional functions, e.g., local gesture recognition. (Ex. PA-5, 2:3-4 (emphasis added) ("**more integration in mobile computing is desired**."); Ex. PA-DEC, ¶ 110.) Moreover, a potential increase in cost of hardware in implementing a local processing capability does not foreclose a finding of obviousness here. *See In re Farrenkopf*, 713 F.2d 714, 718 (Fed. Cir. 1983) (finding additional expense associated with a particular combination would not discourage one of ordinary skill in the art from seeking the benefit expected therefrom). In fact, *Liebermann* itself discloses that the cellular telephone device can function as "an **on-site** translator" rather than just a telephone for the deaf. (Ex. PA-1, 13:37-39 (emphasis added); Ex. PA-DEC, ¶ 110.)

Additionally and alternatively, a POSITA would have understood that the image processing and gesture recognition features could be implemented using known software based on existing hardware. (Ex. PA-1, 4:6-9 (disclosing that the remote processing center provides "computer software for translating functions…"); *id.*, 6:6-10 ("The signing motions captured by the camera are converted into digital data for processing by the translation software…to produce data representing numbers, words and phrases which are then combined into coherent sentences."); *id.*, 7:14-17, 7:48-49 ("Software presently used for this purpose is appended hereto and is utilized with Borland C++.").) Given that, at the time of the alleged invention, it was becoming "more and more pervasive" to integrate "personal computer technology into phones," a POSITA would have understood that the software-driven features for image process and gesture recognition would have been implemented on those phones having the requisite computing power to operate those features. (Ex. PA-3, 1:23-25; Ex. PA-DEC, ¶ 111.) A POSITA would have been motivated to do so as it would have not only provided additional features and applications to the then-existing cellular phone after-market but also substantially avoided the cost of implementing a computer in a cellular phone for the sole purpose of performing the imaging processing and gesture recognition. (Ex. PA-DEC, ¶ 111.)

Furthermore, as a POSITA would have understood, the proposed modification would have reduced network communication demands because the cellular telephone could communicate with another individual directly instead of through an intervening network computer and would have

also improved user conveniences for not requiring communication with a remote processing center that could require additional telecommunication bandwidth. (Ex. PA-DEC, ¶ 112.)

A POSITA would have had a reasonable expectation of success in modifying *Liebermann* in view of *Himmel.* (Ex. PA-DEC, ¶ 113.) Indeed, the '924 patent discloses that "a home PC" has the processing power required to execute gesture, pose, etc. recognition software. (Ex. PAT-A, 2:20-23.) The '924 patent even identified that an Intel Pentium processor that was widely used in a personal computer (like the Intel Pentium processor used in *Himmel*'s smart phone) was capable of executing software for performing the claimed features, e.g., recognizing various poses and gestures in images. (*Id.*, 3:29-34 (disclosing use of "PC computer 106 (integrated in this case into the monitor housing), for example a 400 Mhz Pentium II"); Ex. PAT-C, 6:6-19 (discussing that an "Intel Pentium 2" processor was suitable to execute pose analysis software and analyze when a user made a specific pose).)   A POSITA would have had the skill to implement and expectation of success in achieving such a modification because it would have involved applying known technologies (e.g., cellular telephone cameras and processors) according to known methods (e.g., using processors to detect gestures based on camera data) to yield the predictable result of a cellular phone computer that detects user gestures. (Ex. PA-DEC, ¶ 113.) *See KSR Intern. Co. v. Teleflex Inc.*, 550 U.S. 398, 416 (2007).

> d.   **[1.d] a first camera oriented to view a user of the handheld device and having a first camera output; and**

Liebermann discloses and/or suggests this limitation for the reasons discussed *supra* in Section V.A.2.d.

> e.   **[1.e] a second camera oriented to view an object other than the user of the device and having a second camera output, wherein the first and second cameras include non-overlapping fields of view, and wherein the computer is adapted to perform a control function of the handheld device based on at least one of the first camera output and the second camera output.**

Liebermann in view of *Himmel* discloses and/or suggests this limitation for the reasons discussed *supra* in Section V.A.2.e. (*Supra* Section V.A.2.e.) The modification discussed in claim

element 1[c] (where *Liebermann* is modified in view of *Himmel* (*supra* Section V.D.2.c)) only affects the disclosure discussed *supra* in Section V.A.2.e to the extent it specifies *where* the control "computer" is implemented (i.e., on the cellular telephone to control the cellular telephone, recognize gestures, etc.).

Likewise, the *Liebermann-Himmel* combination discloses or suggests that the claimed "computer is adapted to" perform identified functions under Requester's construction discussed above (*supra* Section IV.B, D), i.e., software running on a computer that is programmed to perform the claimed function or equivalents thereof, for the reasons discussed *supra* in Section V.A.2.e. (*Supra* Section V.A.2.e.) Thus, *Liebermann-Himmel* discloses or suggests this limitation under both the Requester's proposed constructions, and the plain meaning proposed by PO and found by the district court. (*See supra* Section IV; Ex. CC-2.)

> 3. **Claim 2**
>
> > a. **The handheld device of claim 1 wherein the handheld device comprises a mobile phone.**

Liebermann discloses and/or suggests this limitation for the reasons discussed *supra* in Sections V.A.3 and V.D.2.

> 4. **Claim 3**
>
> > a. **The handheld device of claim 1 wherein the first camera is adapted to acquire an image of at least a portion of the user.**

Liebermann discloses and/or suggests this limitation for the reasons discussed *supra* in Sections V.A.4 and V.D.2.

> 5. **Claim 4**
>
> > a. **The handheld device of claim 1 wherein the second camera is adapted to acquire an image of the object.**

Liebermann discloses and/or suggests this limitation for the reasons discussed *supra* in Sections V.A.5 and V.D.2.

> 6. **Claim 5**
>
> > a. **The handheld device of claim 1 wherein**

> the second camera is adapted to acquire a
> video of the object.

Liebermann discloses and/or suggests this limitation for the reasons discussed *supra* in Sections V.A.6 and V.D.2.

7. Claim 6

> **a.** **The handheld device of claim 1 wherein the computer is operable to determine a gesture based on at least one of the first camera output and the second camera output.**

Liebermann in view of *Himmel* discloses and/or suggests this limitation. (Ex. PA-DEC, ¶ 121.) As discussed in Sections V.A.2.e and V.D.2, the computer in the *Liebermann-Himmel* combination can determine gestures based on one or more cameras (i.e., the "first camera," the "second camera" or both) to determine signing motions and gestures. (*Supra* Sections V.A.2.e and V.D.2.) For example, *Liebermann* discloses that the camera "will record the signing movement of the hands and fingers and body and facial motions and expressions," where "**[a] deaf person uses sign language in front of the transmitter/receiver device containing the camera**" and "[t]he **images captured by the camera are of the finger and hand motions and of body motions and of facial expressions** and motions captured by a digital device which does initial processing." (Ex. PA-1, 6:4-47 (emphasis added); Ex. PA-DEC, ¶ 121.) Furthermore, *Liebermann* discloses that a camera may recognize special gloves and gestures performed thereby. (Ex. PA-1, 12:40-43, 13:4-16.) Thus, the computer in the *Liebermann-Himmel* combination (which performs network processing locally as explained above) would have been operable to determine a gesture based on at least one of the first camera output and the second camera output, as claimed in claim 6.

Likewise, the *Liebermann-Himmel* combination discloses or suggests that the claimed "gesture" under Requester's construction discussed above (*supra* Section IV.C), i.e., a sequence of positions that conveys a meaning, as the various "finger and hand motions" to convey sign language, *id.*, 6:4-47; *id.*, 12:30-36 (referring to hand signs as "gesture[s]"), are gestures.

Likewise, the *Liebermann-Himmel* combination discloses or suggests the claimed "gesture" under the district court's construction discussed above (*supra* Section IV.C), i.e., movement of hands or other body parts that conveys meaning, as the various "finger and hand

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motions" to convey sign language, Ex. PA-1, 6:4-47; *id.*, 12:30-36 (referring to hand signs as "gesture[s]"), are gestures. Thus, *Liebermann* discloses or suggests these limitations under the Requester's proposed constructions, the meanings proposed by PO, and the meanings found by the district court. (*See supra* Section IV; Ex. CC-2.)

8. Claim 7

a. The handheld device of claim 1 wherein the computer is operable to determine a facial expression based on at least one of the first camera output and the second camera output.

Liebermann in view of *Himmel* discloses "the computer is operable to determine a facial expression based on at least one of the first camera output and the second camera output." (Ex. PA-DEC, ¶ 123.) For example, *Liebermann* discloses that "**images captured by the camera are of the . . . facial expressions**" of a user. (Ex. PA-1, 6:42-47 (emphasis added).) And the facial expressions of a hearing challenged user are analyzed to determine raised eyebrow facial expressions, teeth exposed facial expressions, etc. (*Id.,* 8:30-9:22; Ex. PA-DEC, ¶ 123.) Thus, the computer in the modified *Liebermann* cellular phone (which performs network processing locally as explained above) would have been operable to determine a facial expression based on at least one of the first camera output and the second camera output, like that claimed here.

9. Claim 8

a. The handheld device of claim 1 wherein the computer is adapted to determine at least one of the position and the orientation of the object based on the second camera output.

Liebermann in view of *Himmel* discloses "the computer is adapted to determine at least one of the position and the orientation of the object based on the second camera output." (Ex. PA-DEC, ¶ 124.) For example, *Liebermann* discloses "[i]t may be desirable to utilize more than one camera to allow the signing person 'free' movement in his or her environment to **track down spatial positions** in that environment." (Ex. PA-1, 13:5-8 (emphasis added); *see also id.*, 13:4-23 (explaining that the two-camera embodiment may determine "coordinates" of an object); *id.*, 13:4-23, 7:19-8:26 (explaining that a second camera may sense signs from another person and location

data is determined); Ex. PAT-A, 3:53-54 (describing a camera that acquires images of "objects such as persons").) Consistent with the analysis discussed above in claim 1 associated with using two cameras (*supra* Section V.D.2.e), a POSITA would have understood that *Liebermann*'s disclosure of "utiliz[ing] more than one camera" includes using its first and second cameras. (Ex. PA-DEC, ¶ 124.) Thus, the computer in the modified *Liebermann* cellular phone (which performs network processing locally as explained above) would have been adapted to determine at least one of the position and the orientation of the object based on the second camera output, as claimed here.

Likewise, the *Liebermann-Himmel* combination discloses or suggests that the claimed "computer is adapted to" perform identified functions under Requester's construction discussed above (*supra* Section IV.B, D), i.e., software running on a computer that is programmed to perform the claimed function or equivalents thereof, for the reasons discussed *supra* in Section V.A.2.e. (*Supra* Section V.A.2.e.)   Thus, *Liebermann* in view of *Himmel* discloses or suggests this limitation under both the Requester's proposed constructions, and the plain meaning proposed by PO and found by the district court. (*See supra* Section IV; Ex. CC-2.)

10.   Claim 10

a.   The handheld device of claim 1 wherein the computer is adapted to recognize the object based on the second camera output.

Liebermann in view of *Himmel* discloses and/or suggests this limitation. (Ex. PA-DEC, ¶ 129.) As discussed in Sections V.A.2.e and V.D.2.e, the computer in the *Liebermann-Himmel* combination can determine gestures based on one or more cameras (i.e., the "first camera," the "second camera" or both) to determine signing motions and gestures. (*Supra* Sections V.A.2.e and V.D.2.e.) For example, *Liebermann* discloses that the multiple cameras (including the "second camera") may be used to define "any objects" or "alive, stationary or moving entities, such as animals" as well as to interpret the signing motions of multiple "person(s)." (Ex. PA-1, 13:4-16; *see also* Ex. PAT-A, 3:53-54 (describing that "objects" include "persons"); Ex. PA-DEC, ¶ 129.) Furthermore, *Liebermann* discloses that a camera may recognize special gloves and gestures performed thereby. (Ex. PA-1, 12:40-43, 13:4-16.)   Accordingly, the *Liebermann-Himmel* computer (which performs network processing locally as explained above) is adapted to perform

this limitation. (Ex. PA-DEC, ¶ 129.)

Likewise, the *Liebermann-Himmel* combination discloses or suggests that the claimed "computer is adapted to" perform identified functions under Requester's construction discussed above (*supra* Section IV.B, D), i.e., software running on a computer that is programmed to perform the claimed function or equivalents thereof, for the reasons discussed *supra* in Section V.A.2.e. (*Supra* Section V.A.2.e.)   Thus, *Liebermann* in view of *Himmel* discloses or suggests this limitation under both the Requester's proposed constructions, and the plain meaning proposed by PO and found by the district court. (*See supra* Section IV; Ex. CC-2.)

11.   Claim 12

a.   The handheld device of claim 1 wherein the computer is adapted to determine a reference frame of the object.

Liebermann in view of *Himmel* discloses or suggests this limitation for at least two reasons. (Ex. PA-DEC, ¶ 131.)   **First**, *Liebermann* discloses "us[ing] special gloves which allow discrimination of the hands from the background for the image processing system." (Ex. PA-1, 12:37-39.) A POSITA would have understood that the background is a "reference frame" of the special glove objects. (Ex. PA-DEC, ¶ 131.) Given that the *Liebermann* system is capable of distinguishing hands/gloves from a background, which requires determining the background from the gloves that perform signing motions/gestures, and that the computer performs network processing locally as explained above, the *Liebermann-Himmel* combination discloses that "the computer is adapted to determine a reference frame of the object." (Ex. PA-DEC, ¶ 131.)

Requester's analysis of the claimed "reference frame of the object" is consistent with the '924 patent. (Ex. PA-DEC, ¶ 132.) For example, the '924 patent describes that a reference frame can be a wall-mounted screen that is separate/distinctive from the object/person that performs gestures. (Ex. PAT-A, 26:32-40 (emphasis added) ("Note that a camera such as 1902, looking at you the user, if attached to hand held unit, always has reference frame of that unit. If one works with **a screen on a wall**, one can aim the handheld unit with camera at it, and determine its reference frame to the handheld unit. Also can have two cameras operating together, **one looking at wall thing**, **other at you** (as 1902 and 1902a) in this manner, one can dynamically **compare ref frames of the display to the human input means** in determining display parameters.").)

Liebermann in view of *Himmel* discloses this limitation for a **second** reason. (Ex. PA-DEC, ¶ 133.) As discussed above in Sections V.A.2.e and V.D.2.e, the second camera is oriented to view an object other than the user of the device. (*Supra* Sections V.A.2.e and V.D.2.e.) Furthermore, *Liebermann* details how the system recognizes various objects and corresponding hand gestures in Figures 9 and 10. (Ex. PA-1, 7:44-46 ("The modules for the software effect translation of the signing into and from digital text are set forth in FIGS. 9 and 10.").) Specifically, the system performs an XOR operation on the image frames to detect pauses and movement as a part of the gesture determination process. (*Id.*, FIGs. 9, 10.)
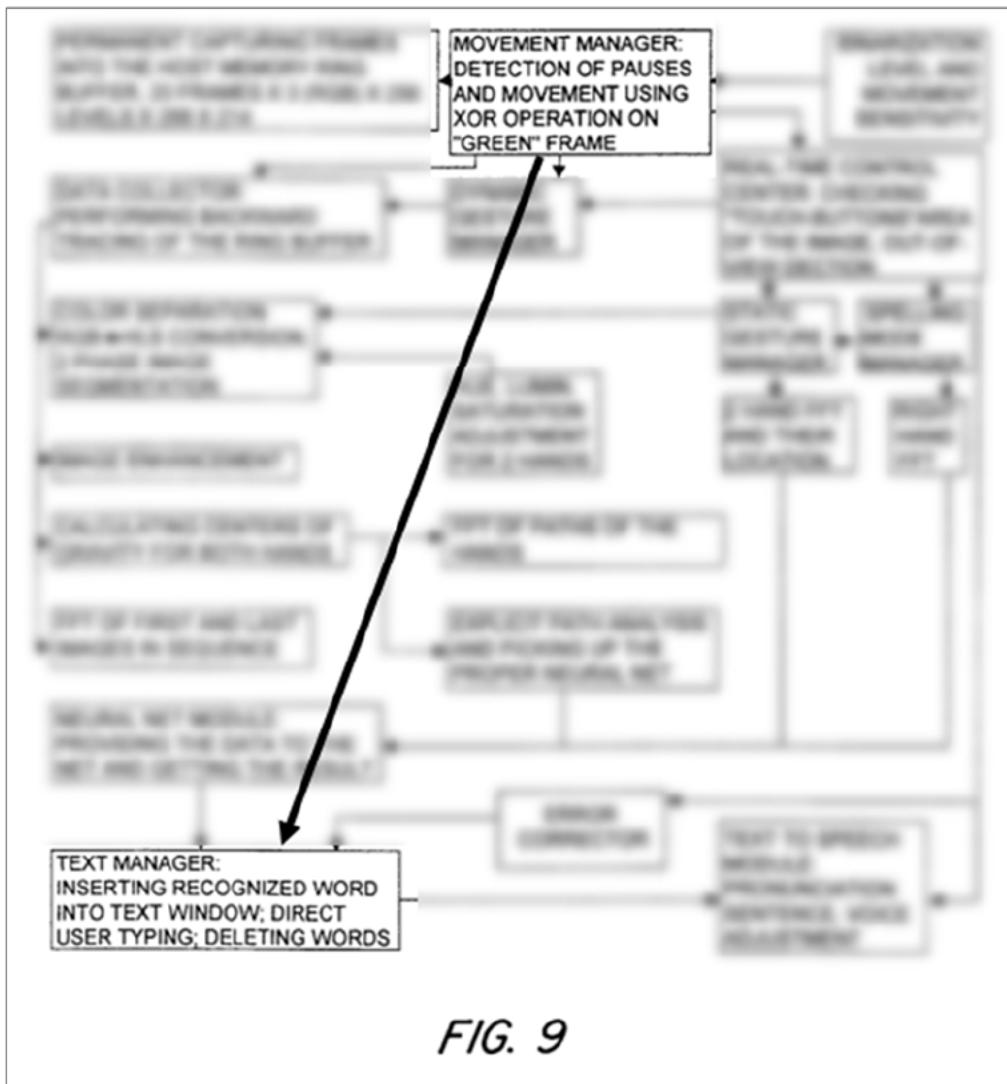
FIG. 9

(*Id.*, FIG. 9 (annotated and blurred for emphasis).)
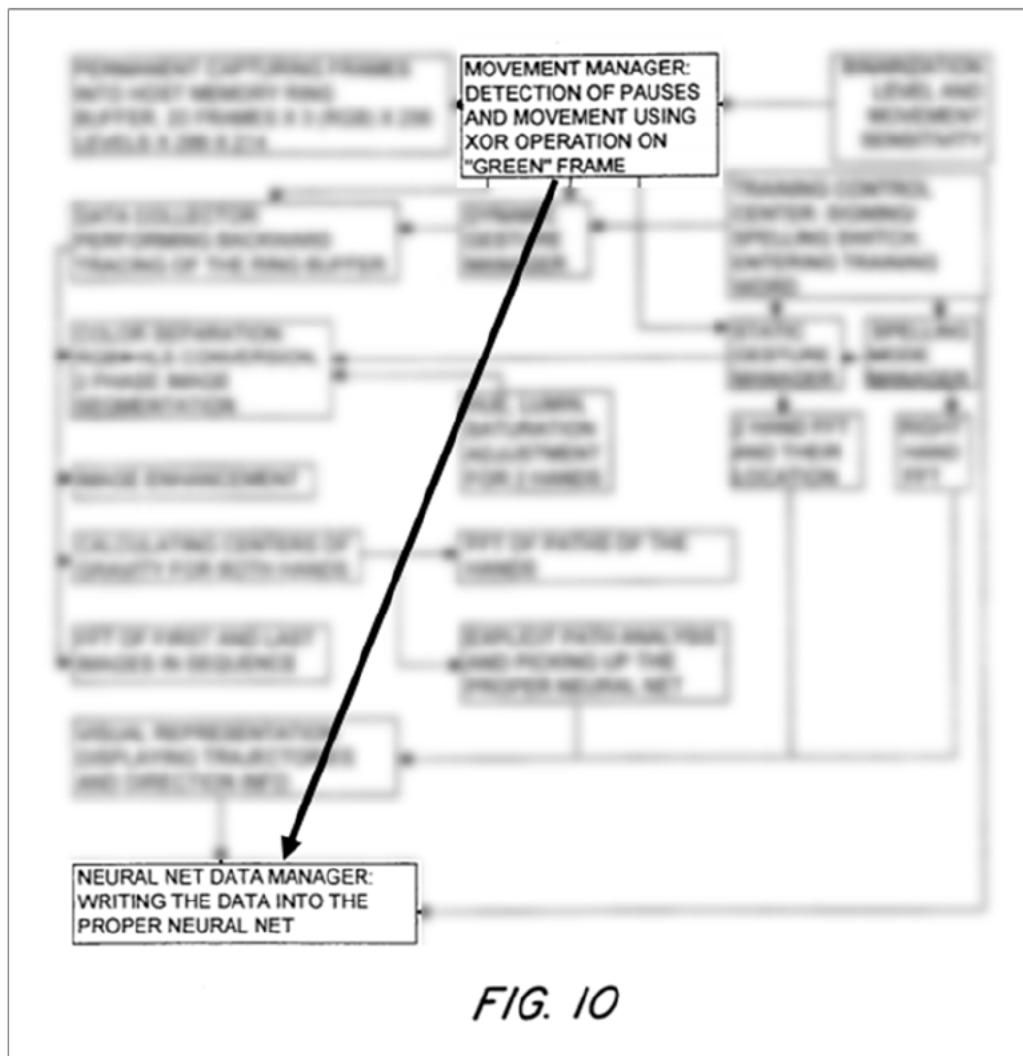
FIG. 10

(*Id.*, FIG. 10 (annotated and blurred for emphasis).) A POSITA would have understood that the XOR operation disclosed by *Liebermann* involves a comparison between a first data set (e.g., from a first image frame) and a second data set (e.g., from a second data frame). (*See generally* Ex. PA-10, 8 ("Note that the XOR function is true if and only if the operands are different.").) Accordingly, a POSITA would have understood that XOR operation disclosed by *Liebermann* refers to a comparison function between image frames to determine pauses and movement. (Ex. PA-1, FIGs. 9, 10; Ex. PA-DEC, ¶ 133.) When the system performs the XOR operation (as the cellular telephone computer performs network processing locally as explained above), a POSITA would have understood that one of the frames is deemed as the reference frame to be compared with another frame for the XOR comparison operation. Thus, the computer in the *Liebermann-Himmel* combination would have been adapted to determine a reference frame of the object and thus discloses the limitations of claim 12. (Ex. PA-DEC, ¶ 133.) Thus, *Liebermann* in view of

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Himmel discloses or suggests this limitation under both the Requester's proposed constructions, and the plain meaning proposed by PO and found by the district court. (*See supra* Section IV; Ex. CC-2.)

12.   Claim 13

> a.   **The handheld device of claim 1 wherein the computer is adapted to perform a control function based on the first camera output and based on the second camera output.**

Liebermann in view of *Himmel* discloses and/or suggests this limitation for the reasons discussed above in Sections V.A.7 and V.D.2. The computer in the *Liebermann-Himmel* cellular phone would have been adapted to perform the control function based on the first camera output and second camera output, like that claimed here. (*Supra* Sections V.A.7 and V.D.2.) Specifically, the *Liebermann* cellular telephone displays the text of what was signed in accordance with data from two cameras as claimed, *supra* Section V.A.7; Ex. PA-1, 13:4-21, 7:49-8:26, FIG. 8, and, as modified, the *Himmel* computer of the *Liebermann* cellular telephone powers/controls the phone the perform the claimed operation, *supra* Section V.D.2, Ex. PA-3, 5:42-63, FIG. 3 (discussing how the cellular telephone computer controls display information, processes gestures from cameras, etc.).

Likewise, the *Liebermann-Himmel* combination discloses or suggests that the claimed "computer is adapted to" perform identified functions under Requester's construction discussed above (*supra* Section IV.B, D), i.e., software running on a computer that is programmed to perform the claimed function or equivalents thereof, for the reasons discussed *supra* in Section V.A.2.e. (*Supra* Section V.A.2.e.) Thus, *Liebermann* in view of *Himmel* discloses or suggests this limitation under both the Requester's proposed constructions, and the plain meaning proposed by PO and found by the district court. (*See* Section IV.)

E.   SNQ5: *Liebermann* in view of *Himmel* and *Tryding*

1.   Claim 11

> a.   **The handheld device of claim 1 wherein the computer is adapted to generate control instructions for a display that is separate from the handheld device.**

Liebermann in view of *Himmel* and *Tryding* discloses and/or suggests this limitation for the reasons discussed *supra* in Sections V.B and V.D.2. (Ex. PA-DEC, ¶ 136.) The analysis for modifying *Liebermann* in light of *Tryding* (Section V.B) is applicable to the modified *Liebermann-Himmel* combination discussed above for claim 1 (Section V.D.2). Thus, given that the computer in the modified *Liebermann-Himmel* cellular phone would have controlled the cellular telephone, *supra* Section V.D.2; Ex. PA-DEC, ¶ 137, a POSITA would have been motivated to configure the computer such that it is adapted to perform the display function, like that described by *Tryding*, for the reasons discussed. (Ex. PA-DEC, ¶ 137.)

F.   SNQ6: *Liebermann* in view of *Himmel* and *Gershman*

1.   Claim 14

a.   The handheld device of claim 1 wherein the computer is adapted to transmit information over an internet connection.

Liebermann in view of *Himmel* and *Gershman* discloses this limitation for the reasons discussed *supra* in Sections V.C and V.D.2. (Ex. PA-DEC, ¶ 138.)   The analysis for modifying *Liebermann* in light of *Gershman* (Section V.C) is applicable to the modified *Liebermann-Himmel* combination discussed above for claim 1 (Section V.D.2). Thus, given that the computer in the modified *Liebermann-Himmel* cellular phone would have controlled the cellular telephone, *supra* Section V.D.2; Ex. PA-DEC, ¶ 139, a POSITA would have been motivated to configure the computer such that it is adapted to perform the internet function, like that described by *Gershman*, for the reasons discussed. (Ex. PA-DEC, ¶ 139.)   Thus, *Liebermann* in view of *Himmel* and *Gershman* discloses or suggests this limitation under both the Requester's proposed constructions, and the plain meaning proposed by PO and found by the district court. (*See supra* Section IV; Ex. CC-2.)

G.   SNQ7: *Liebermann* in view of *Sears*

As explained below and in the attached declaration of Dr. Abowd (Ex. PA-DEC), *Sears* discloses or suggests the limitations of claims 1-8, 10, and 12-13 of the '924 patent. (Ex. PA-DEC, ¶ 140.)

1.   Overview of *Sears*

Sears discloses reading machines that are controlled with natural "hand gestures." (Ex. PA-2, Abstract.) Similar to *Liebermann*, *Sears* teaches "portable," gesture-controlled machines with multiple cameras. (Ex. PA-2, Abstract (emphasis added) ("An optical-input print reading device with voice output for people with impaired or no vision in which the user provides input to the system from hand gestures. . . . [A] computer . . . tracks the location and movement of the hand and fingers in order to interpret the gestural movements into their command meaning. . . . **Multiple cameras** of the same or different field of view can improve performance. In addition, alternative device configurations allow **portable** operation, including the use of cameras located on worn platforms, such as eyeglasses, or on a fingertip system.").) For example, Figures 3 and 4 of *Sears* detail embodiments of various portable reading machines. (*Id.*, 20:67-21:16 (discussing a "portable" version of the reading machine depicted in Figure 3); *id.*, (describing an example of a worn reading machine depicted in Figure 4); *id.*, FIGs. 1, 3-4.)

(*Id.*, FIG. 3.)

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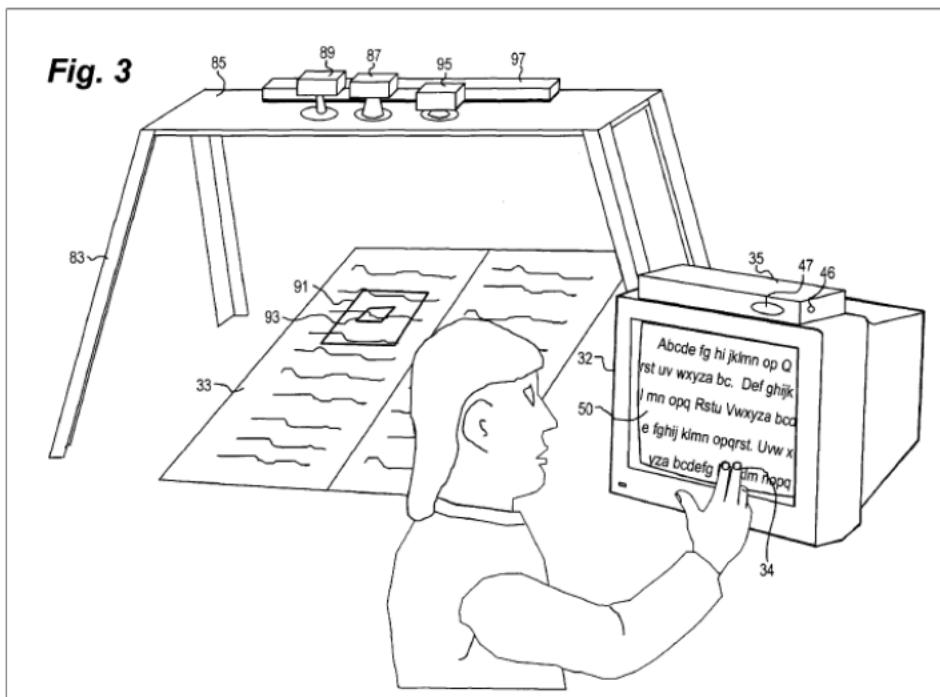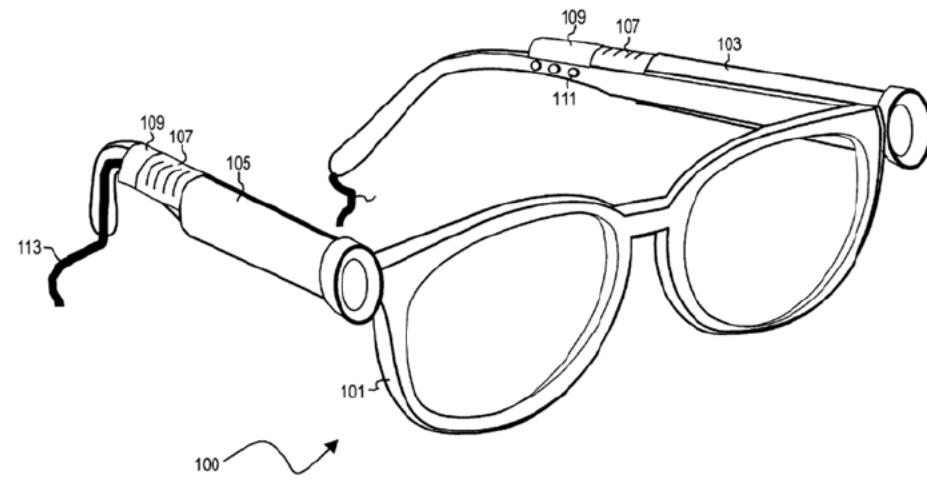
Fig. 4

(*Id.*, FIG. 4.)

Sears teaches using gestures to control cameras, turn a device off, and otherwise control the portable reading device. In one instance, a fist gesture triggers a control function that instructs the device to power down. (*Id.*, 10:29-30 (emphasis added) ("A closed fist could be used to direct the electronic reader to **shut itself off**.").) In another instance, a gesture triggers a control function that instructs the device to stop operating. (*Id.*, 11:7-9 (emphasis added) ("The particular linkage of a gesture with a command may be cognitively linked—e.g. a flat hand, like **a "stop" motion, may be used to stop reading**.").) In another instance, a gesture triggers the device to snap an image/picture to assist those who may have a disability. (*Id.*, 15:47-56 (emphasis added) ("In addition, or alternatively, the text and images captured by the system of the present invention can be used to input the text and images for storage and use on the main system 35 computer. This might be used, for instance, as a **low-resolution scanner and text input mechanism for general application by users who may or may not have a disability**. For example, home or business users can **make manual gestures to copy portions of letters, bills, and advertisements into computer storage files**.").) Indeed, *Sears* discloses that "many different gestures may be linked with different commands within the spirit of the present invention" to control the device itself. (*Id.*, 11:10-12.)

More generally, *Sears* discloses various gesture detecting devices and is in the same or similar technical field as the '924 patent. (*Id.*, Abstract, FIGs. 1, 3-4; Ex. PAT-A, 2:7-21 ("The invention relates to simple input devices for computers . . . . The invention uses single or multiple

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TV cameras whose output is analyzed and used as input to a computer."); Ex. PA-DEC, ¶ 51.) To the extent *Sears* is not in the field of endeavor of '924 patent (it is), *Sears* is reasonably pertinent to problems associated with controlling devices according to user gestures, problems with which the inventor was involved. (Ex. PA-2, FIGs. 3 and 4; Ex. PAT-A, 11:9-11; Ex. PA-DEC, ¶ 51.)

2.   Claim 1

a.   [1.a] A handheld device comprising:

Liebermann discloses and/or suggests this limitation for the reasons discussed *supra* in Section V.A.2.a.

b.   [1.b] a housing;

Liebermann discloses and/or suggests this limitation for the reasons discussed *supra* in Section V.A.2.b.

c.   [1.c] a computer within the housing;

While *Liebermann* discloses that the cellular telephone performs "initial processing" and populates a phone display, among other things (*supra* Section V.A.2.c; Ex. PA-1, 5:62-6:10, 6:40-52, FIG. 8), it discloses that aspects of gesture recognition occur on a network server, Ex. PA-1, 6:41-63, FIG. 1. To the extent *Liebermann* is read not to disclose a computer within the housing of the cellular telephone, this feature would have been obvious in view of *Sears*. (Ex. PA-DEC, ¶ 143.) For example, it would have been obvious to perform all processing steps, including the initial processing and the gesture recognition process, locally on a computer of the cellular telephone. (Ex. PA-DEC, ¶ 143.)

The *Liebermann* communication system converts sign language gestures to speech that can be transmitted to a person on the other side of a call. (Ex. PA-1, FIG. 1; *id.*, 12:30-36 (referring to hand signs as "gesture[s]").) To do so, one or more cameras in the cellular telephone record a user making hand sign gestures. (*Id.*, 5:62-6:9 (describing how the cellular telephone camera records the signing movement of user hands); *id.*, 13:4-16 (teaching a two-camera embodiment); *id.*, FIG. 6.) After performing "initial processing" to collapse gesture images into small sets of fixed identifiers, the cellular telephone outsources a networked computer to determine which hand gestures a user makes. (*Id.*, 6:41-63 (describing how a network data processing center identifies signing movements to convert the signs to text); *id.*, 12:30-36 (referring to hand signs as "gesture[s]"); Ex. PA-DEC, ¶ 144.)
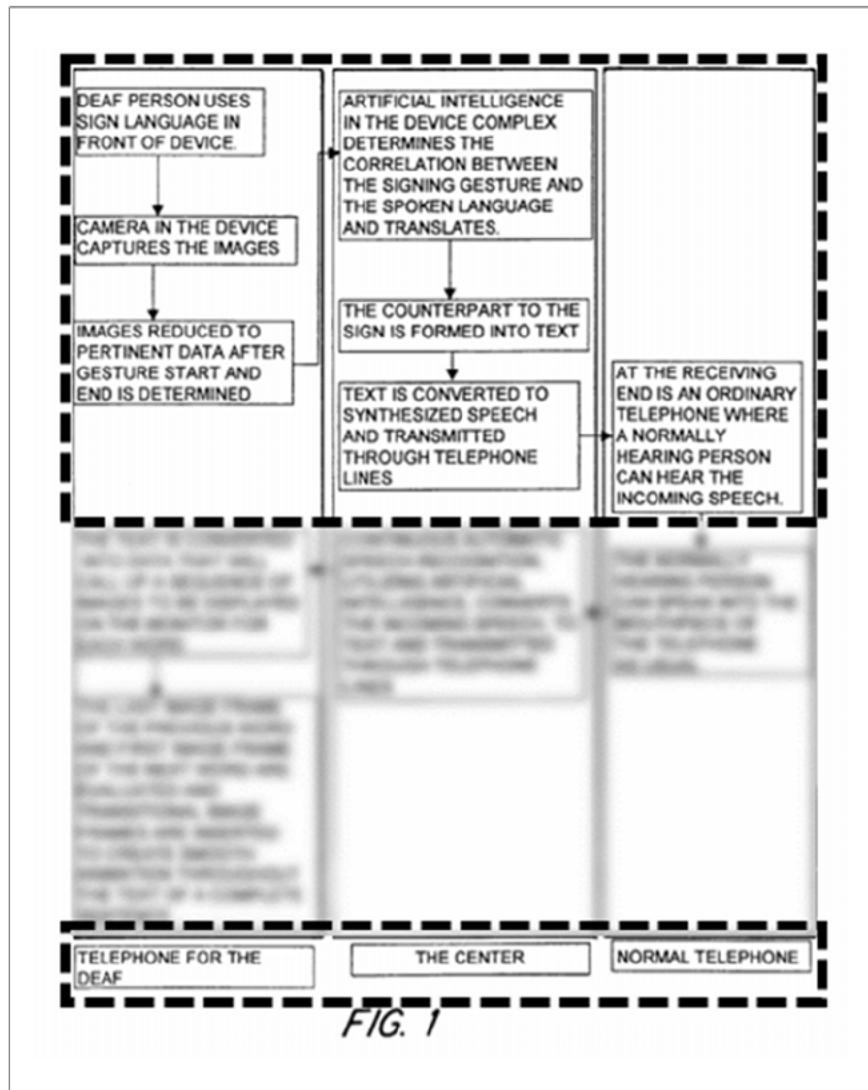
FIG. 1

(*Id.*, FIG. 1 (annotated and blurred for emphasis) (disclosing a telephone for the deaf that captures images of hand sign gestures and a center computer that determines what hand sign gestures were made).)

It would have been obvious to process camera outputs locally within a cellular telephone computer instead of at the networked computer. (Ex. PA-DEC, ¶ 145.) *See In re Yufa*, 452 F. App'x. 998, 1001 (Fed. Cir. 2012) (citing *KSR Intern. Co. v. Teleflex Inc.*, 550 U.S. 398, 417 (2007)) (affirming obviousness because the prior art disclosed "every element of the claims except" the location for "the processing of" data, which was "nothing more than a reconfiguration of a known system"). Indeed, *Liebermann* itself suggests that the location where processing occurs is a matter of design choice. Specifically, *Liebermann* discloses that it uses a network computer to process gesture information because it is "economic[]" to do so. (Ex. PA-1, 6:10-12; *see also*

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id., 3:38-42 ("From cost and portability standpoints, the translating means is at a remote location or central station.").)   While a network computer was an economic solution envisioned by *Liebermann* (*id.*, 6:10-12), a POSITA would have understood that other processing options were also available, and that there would have been reasons motivating such alternatives. (Ex. PA-DEC, ¶ 145.)

For instance, *Sears* discloses a computer that analyzes images to determine when a user makes a hand gesture. *Sears* discloses that main system 35 includes a "computer." (Ex. PA-2, 7:1 ("main system 35 computer"); *id.*, 18:11-12 ("the computer located in the main system 35").) *Sears* also discloses that main system 35 analyzes images from a camera. (*Id.*, 5:51-54 ("The output digital image, consisting of a two-dimensional array of pixel values (generally either 8-bit gray-scale or 24-bit color) is then sent to a digital computer where the image is analyzed in at least two modes."); *id.*, 18:9-15 (explaining that main system 35 is coupled to cameras and is "engaged in the analysis of images").) Pertinent to the *Liebermann* gesture-detecting system, the computer in *Sears* determines whether a gesture has been performed based on camera images. (*Id.*, 17:55-58 (describing that gestures are tracked "using algorithms previously described"); *id.*, 5:44-6:10, 6:52-7:2 (explaining that main system 35 analyzes camera images to determine when various "gestures" have been performed); Ex. PA-DEC, ¶ 146.)[11]

Furthermore, the computer disclosed by *Sears* was capable of being implemented in a variety of portable housings. *Sears* discloses that the computer can be implemented using a processor "chip." (Ex. PA-2, 7:1-7 (emphasis added) ("The main system 35 computer should be of sufficient power to perform the remaining steps of the process. In general, any **Intel Pentium** or compatible **chip** of 150 MHz speed will be sufficient, although a faster speed will provide improved results. In addition, other **non-Intel processors**, such as those that are used in **Windows CE Systems**, will suffice if they are of a similar performance.").)   A POSITA would have understood that a discrete computer chip, such an "Intel Pentium" or "non-Intel" processor, *id.*, would have been implemented in a variety of portable devices. (Ex. PA-DEC, ¶ 147.) Indeed, the "Windows CE" (Windows Embedded Compact) and processor platform identified by *Sears* was

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[11] *Sears* discloses with reference to the Figure 3 embodiment that gestures are tracked "using algorithms previously described." (Ex. PA-1, 17:55-58.) Thus, a POSITA would have understood that disclosures associated with gesture determinations disclosed with reference in the preceding embodiments apply to the embodiment associated with Figure 3. (Ex. PA-DEC, ¶ 146 n.3.)

designed for such portable purposes. (Ex. PA-2, 7:1-7; Ex. PA-6, 1 ("Windows CE was designed and built from the ground up as an embedded platform to empower the development of a new range of emerging computing appliances, including highly portable and personal computing devices.").) And *Sears* discloses several examples of portable housings that include the computer chip. (Ex. PA-2, FIGs. 1a, 3; *id.*, 20:65-21:16 (describing portable reading machines (which include a computer)); *id.*, 21:30-33 ("The cords 113 lead to a computer that may be carried in various means, including backpacks, hip packs, shoulder bags or an article of clothing such as a vest.").)
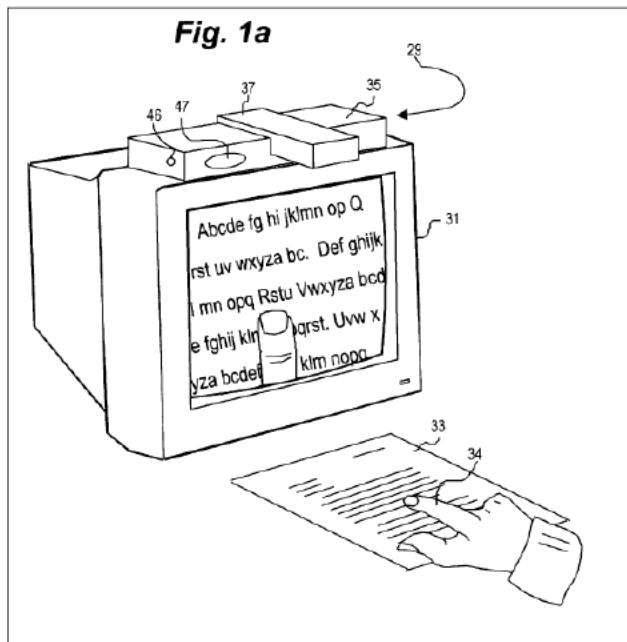
(Id., FIG. 1a (illustrating a housing which includes a main system 35 computer).)

55
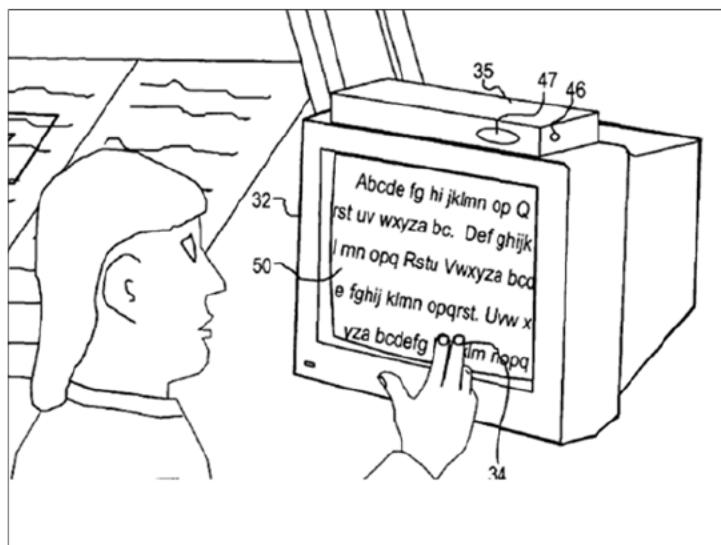
(*Id.*, FIG. 3 (excerpt) (illustrating a housing which includes a main system 35 computer).)

The '924 patent does not disclose anything special about the claimed "computer within the housing." (Ex. PA-DEC, ¶ 148.) Indeed, the '924 patent admits that the alleged invention "uses single or multiple TV cameras whose output is analyzed and used as input to a computer, such as a home PC." (Ex. PAT-A, 2:20-23; *see also id.*, 3:32-34 (disclosing use of "PC computer").) The '924 patent even identified that an Intel Pentium processor that was widely used in a personal computer (like the Intel Pentium processor disclosed by *Sears*) was capable of executing software for performing the claimed features, e.g., recognizing various poses and gestures in images. (*Id.*, 3:29-34 (disclosing use of "PC computer 106 (integrated in this case into the monitor housing), for example a 400 Mhz Pentium II"); Ex. PAT-C, 6:6-19 (discussing that an "Intel Pentium 2" processor was suitable to execute pose analysis software and analyze when a user made a specific pose).) Thus, a POSITA would have similarly understood that the computing capacity of the Intel Pentium processor would have provided a cellular telephone, similar to as discussed in *Liebermann*, the capability of performing various claimed features, e.g., "perform[ing] a control function of the handheld device based on at least one of the first camera output and the second camera output." (*Infra* Section V.G.2.e; Ex. PA-DEC, ¶ 148.)

A POSITA would have found it obvious to include a computer, similar to as disclosed in *Sears*, within the housing to perform local image processing and gesture recognition when implementing a cellular telephone similar to as disclosed in *Liebermann*. (Ex. PA-DEC, ¶ 149.) As a POSITA would have understood, performing the process sign translation or gesture recognition at a remote server was no more than a design choice based on an economic decision. (Ex. PA-1, 6:10-12.)   While the proposed modification may have required more expensive hardware, a POSITA would have appreciated that customers would desire highly-integrated smart phone devices that could perform additional functions, e.g., local gesture recognition. (Ex. PA-5, 2:3-4 (emphasis added) ("**more integration in mobile computing is desired**."); Ex. PA-DEC, ¶ 149.) Moreover, a potential increase in cost of hardware in implementing a local processing capability does not foreclose a finding of obviousness here. *See In re Farrenkopf*, 713 F.2d 714, 718 (Fed. Cir. 1983) (finding additional expense associated with a particular combination would not discourage one of ordinary skill in the art from seeking the benefit expected therefrom). In fact, *Liebermann* itself discloses that the cellular telephone device can function as "an **on-site**

translator" rather than just a telephone for the deaf. (Ex. PA-1, 13:37-39 (emphasis added); Ex. PA-DEC, ¶ 149.)

Additionally and alternatively, a POSITA would have understood that the image processing and gesture recognition features could be implemented using known software based on existing hardware. (Ex. PA-1, 4:6-9 (disclosing that the remote processing center provides "computer software for translating functions…"); *id.*, 6:6-10 ("The signing motions captured by the camera are converted into digital data for processing by the translation software…to produce data representing numbers, words and phrases which are then combined into coherent sentences."); *id.*, 7:14-17, 7:48-49 ("Software presently used for this purpose is appended hereto and is utilized with Borland C++.").) At the time of the alleged invention, it was becoming "more and more pervasive" to integrate "personal computer technology into phones," Ex. PA-3, 1:23-25, and a POSITA would have understood that the software-driven features for image process and gesture recognition would have been implemented on various computer chips having the requisite computing power to operate those features (such as those described by *Sears*). (Ex. PA-2, 7:1-7; Ex. PA-DEC, ¶ 150.) A POSITA would have been motivated to do so as it would have not only provided additional features and applications to the then-existing cellular phone after-market but also substantially avoided the cost of implementing a computer in a cellular phone for the sole purpose of performing the imaging processing and gesture recognition. (Ex. PA-DEC, ¶ 150.)

Furthermore, as a POSITA would have understood, the proposed modification would have reduced network communication demands because the cellular telephone could communicate with another individual directly instead of through an intervening network computer and would have also improved user conveniences for not requiring communication with a remote processing center that could require additional telecommunication bandwidth. (Ex. PA-DEC, ¶ 151.)

A POSITA would have had a reasonable expectation of success in modifying *Liebermann* in view of *Sears.* (Ex. PA-DEC, ¶ 152.) Indeed, the '924 patent discloses that "a home PC" has the processing power required to execute gesture, pose, etc. recognition software. (Ex. PAT-A, 2:20-23.) The '924 patent even identified that an Intel Pentium processor that was widely used in a personal computer (like the Intel Pentium processor used in *Sears*) was capable of executing software for performing the claimed features, e.g., recognizing various poses and gestures in images. (*Id.*, 3:29-34 (disclosing use of "PC computer 106 (integrated in this case into the monitor housing), for example a 400 Mhz Pentium II"); Ex. PAT-C, 6:6-19 (discussing that an "Intel

Pentium 2" processor was suitable to execute pose analysis software and analyze when a user made a specific pose).)   A POSITA would have had the skill to implement, and expectation of success in achieving such a modification because it would have involved applying known technologies (e.g., cellular telephone cameras and processors) according to known methods (e.g., using processors to detect gestures based on camera data) to yield the predictable result of a cellular phone computer that detects user gestures. (Ex. PA-DEC, ¶ 152.) *See KSR Intern. Co. v. Teleflex Inc.*, 550 U.S. 398, 416 (2007).

> **d.   [1.d] a first camera oriented to view a user of the handheld device and having a first camera output; and**

Liebermann discloses this limitation for the reasons discussed *supra* in Section V.A.2.d.

> **e.   [1.e] a second camera oriented to view an object other than the user of the device and having a second camera output, wherein the first and second cameras include non-overlapping fields of view, and wherein the computer is adapted to perform a control function of the handheld device based on at least one of the first camera output and the second camera output.**

As discussed above, *Liebermann* discloses this limitation. (*Supra* Section V.A.2.e.) To the extent *Liebermann* is read not to disclose "a second camera oriented to view an object other than the user of the device . . . and wherein the computer is adapted to perform a control function of the handheld device based on at least one of the first camera output and the second camera output," the limitation would have been obvious in light of *Sears*. (Ex. PA-DEC, ¶ 154.)

Similar to *Liebermann*, *Sears* teaches "portable," gesture-controlled machines with multiple cameras. (Ex. PA-2, Abstract (emphasis added) ("An optical-input print reading device with voice output for people with impaired or no vision in which the user provides input to the system from hand gestures. . . . [A] computer . . . tracks the location and movement of the hand and fingers in order to interpret the gestural movements into their command meaning. . . . **Multiple cameras** of the same or different field of view can improve performance. In addition, alternative device configurations allow **portable** operation, including the use of cameras located on worn platforms, such as eyeglasses, or on a fingertip system.").) For instance, *Sears* discloses that the

multiple-camera reading machine disclosed in Figure 3 may be implemented as a "portable version." (*Id.*, 20:67-21:7, 16:14-15; *id.*, FIG. 3 (illustrating a reading machine with cameras 87 and 89).) In the "portable version" of the reading machine, the device "may be supported on collapsible or hinged legs, or may even be available in forms without leg supports, and be worn by the user." (*Id.*, 20:67-21:7.) Moreover, "the cameras, illuminators and scanners, or some subset of these, may be worn on a head-mount, such as on a pair of glasses, telephone headset, headphones, or cap" in the portable version. (*Id.*) The reading machine disclosed in Figure 4 discloses one such portable glasses embodiment. (*Id.*, 21:7-9 ("An example of such a worn reading machine is shown in FIG. 4, a perspective diagram of an eyeglass reading machine 100."); *id.*, FIG. 4 (illustrating a reading machine with cameras 103 and 105).)

In particular, *Sears* discloses a first camera that senses user "gestures." *Sears* discloses in the context of Figure 3 that camera 87 of the reading machine is configured to detect the gestures of a user. (Ex. PA-2, 16:14-18 ("A low-magnification wide-angle FOV camera 87 is used to track command gestures.").) Camera 103 performs a similar function in the embodiment associated with Figure 4. (*Id.*, 21:11-13 ("A wide-field camera 103 on one eyeglass earpiece provides functionality similar to that of the wide-field camera 87 of FIG. 3."); Ex. PA-DEC, ¶ 156.)

Sears discloses a main system computer analyzes camera images for gestures. In *Sears*, the main system 35 computer within a housing analyzes images from a camera. (*Supra* Section V.G.2.c (explaining that 35 includes a computer chip inside of a housing); Ex. PA-2, 18:9-38 (explaining that 35 analyzes camera images).) The images are analyzed by the computer to determine when a gesture has been made. (Ex. PA-2, 22:5-8 ("[I]n these embodiments, the camera received commands, at least in part, from hand and finger gestures of the user that were captured by the camera or cameras."); *id.*, 17:55-58 (describing that gestures are tracked "using algorithms previously described"); *id.*, 5:44-6:10, 6:52-7:2 (explaining that main system 35 analyzes camera images to determine when various "gestures" have been performed); Ex. PA-DEC, ¶ 157.)

Sears discloses that various control functions of the device are triggered when the computer detects a specific command gesture using the camera(s). (Ex. PA-DEC, ¶ 158.) Thus, *Sears* discloses "the computer is adapted to perform a control function of the handheld device based on at least one of the first camera output and the second camera output," as claimed. With respect to this claimed feature, the '924 patent discloses that a control function of a handheld device includes

controlling the device "itself" to perform a function, e.g., a base function of the device or a method to interact with the device to achieve other purposes. (Ex. PAT-A, 11:65-12:3 (emphasis added) ("FIG. 8A illustrates control of functions with the invention, using **a handheld device which *itself* has functions** (for example, a cell phone). The purpose is to add functionality to the device, without complicating its **base function**, and/or alternatively **add a method to interact with the device to achieve other purposes**.").) *Sears* teaches using gestures to control cameras, turn the device off, and otherwise control the portable device. In one instance, a fist gesture triggers a control function that instructs the device to power down. (Ex. PA-2, 10:29-30 ("A closed fist could be used to direct the electronic reader to shut itself off.").) In another instance, a gesture triggers a control function that instructs the device to stop operating. (*Id.*, 11:7-9 ("The particular linkage of a gesture with a command may be cognitively linked—e.g. a flat hand, like a "stop" motion, may be used to stop reading.").) In another instance, a gesture triggers a control function that instructs the device to snap an image/picture for those who may have a disability. (*Id.*, 15:47-56 ("In addition, or alternatively, the text and images captured by the system of the present invention can be used to input the text and images for storage and use on the main system 35 computer. This might be used, for instance, as a low-resolution scanner and text input mechanism for general application by users who may or may not have a disability. For example, home or business users can make manual gestures to copy portions of letters, bills, and advertisements into computer storage files."); Ex. PAT-A, 13:20-26 (explaining that a control function includes instructing a device camera to "take images of things").) Indeed, *Sears* discloses that "many different gestures may be linked with different commands within the spirit of the present invention" to control the device itself. (*Id.*, 11:10-12.) A POSITA would have understood that the computer, which processes and responds to gestures, *id*, 18:9-38; *id.,* 22:5-8; *id.*, 17:55-58; *id.*, 5:44-6:10, 6:52-7:2, at least includes the hardware to perform these control functions based off camera data. (Ex. PA-DEC, ¶ 158.) Moreover, such control functions may occur as a result of a single gesture image. (Ex. PA-2, 5:51-58 ("The output digital image, consisting of a two-dimensional array of pixel values (generally either 8-bit gray-scale or 24-bit color) is then sent to a digital computer where the image is analyzed in at least two modes. In the first mode, the image is converted into its text representation in an optical character recognition step 55, whereas in the second mode, the image is analyzed for the presence, orientation and movement of a pointer object (e.g. a finger 34, shown

in FIG. 1).”); *id.*, 18:9-14, 18:25-45, 22:5-8, 17:55-58 (discussing how the computer performs image analysis of gestures and the image capture steps).)

It would have been obvious to implement *Liebermann*’s computer such that it performs a control function of the handheld device based on at least one of the first camera output and the second camera output in view of *Sears*. (Ex. PA-DEC, ¶ 159.) For example, one or more of the cameras disclosed in the *Liebermann-Sears* combination (the “first camera,” the “second camera,” or both) would detect gestures based on the images captures by the camera(s) and the cellular telephone computer would, in response, perform control functions to turn the device off, stop operating, snap a picture, etc. (Ex. PA-DEC, ¶ 159.) A POSITA would have been motivated to control the device with gestures for the increased conveniences associated with natural gesture control. (Ex. PA-2, Abstract (“The use of gestural commands is natural.”); Ex. PA-DEC, ¶ 159.) Furthermore, as a POSITA would have understood, such implementation would have provided additional ways to control the cellular phone device, providing flexibility when operating the device. For example, being able to stop the operation of device with gestures would have prevented incorrect sign communications from being transmitted to the receiving party. (Ex. PA-DEC, ¶ 159.)

A POSITA would have had a reasonable expectation of success in modifying *Liebermann* in view of *Sears*. Like *Liebermann*, which discloses a software-driven scheme for gesture detection implemented on its computer, *Sears* discloses using software programs to detect various gestures and perform a host of other functions. (Ex. PA-2, 27:30-34 (“Because the computer of the main system is generally high performance, this allows considerable ‘intelligence’ to reside in the software program for tracking text, rather than requiring the user to track it manually.”); *id.*, 16:24 (explaining that the computer of main system runs “software”); *id.*, 7:1-11 (expressing that main system may run Windows and other programs); 18:9-15 (explaining that main system 35 controls the cameras); *id.*, 16:17-19 (describing that camera 87 tracks gestures); *id.*, 18:9-13 (describing that main system 35 analyzes images from camera 87); *id.*, 17:55-58 (describing that gestures are tracked “using algorithms previously described”); *id.*, 7:66-67 (referencing “commonly used tracking algorithms”).) Thus, a POSITA would have been motivated to implement these software-driven features (e.g., as in *Sears*) in *Liebermann* and would have reasonable expectation of success in doing so. Moreover, the modification would have involved known technologies (e.g., a handheld device with multiple cameras) according to known methods

(e.g., using cameras to control a device with gestures) to yield the predictable result of using the cellular telephone cameras and computer to perform various control functions for the device itself. (Ex. PA-DEC, ¶ 160.) *See KSR Intern. Co. v. Teleflex Inc.*, 550 U.S. 398, 416 (2007). The *Liebermann* cellular telephone includes dual camera hardware, a computer, and detects gestures as explained above. Using gestures to command the system as described by *Sears* would have done no more than provide another predictable way to control the functions of the cellular telephone (turn the device off, etc.). (Ex. PA-DEC, ¶ 160.)

Likewise, the *Liebermann-Sears* combination discloses that the claimed "computer is adapted to" perform identified functions under Requester's construction discussed above (*supra* Section IV.B, D), i.e., software running on a computer that is programmed to perform the claimed function or equivalents thereof, for the same reasons discussed herein. (*See also supra* Section V.A.2.e.) Thus, *Liebermann* in view of *Sears* discloses or suggests this limitation under both the Requester's proposed constructions, and the plain meaning proposed by PO and found by the district court. (*See* Section IV.)

> ### 3.   Claim 2
>
> > **a.   The handheld device of claim 1 wherein the handheld device comprises a mobile phone.**

Liebermann discloses and/or suggests this limitation for the reasons discussed *supra* in Sections V.A.3 and V.G.2.

> ### 4.   Claim 3
>
> > **a.   The handheld device of claim 1 wherein the first camera is adapted to acquire an image of at least a portion of the user.**

Liebermann discloses this limitation for the reasons discussed *supra* in Sections V.A.4 and V.G.2.

> ### 5.   Claim 4
>
> > **a.   The handheld device of claim 1 wherein the second camera is adapted to acquire an image of the object.**

Liebermann discloses and/or suggests this limitation for the reasons discussed *supra* in Sections V.A.5 and V.G.2. Regardless of the object that is acquired, *supra* Sections V.A.5, V.G.2, the *Liebermann* cameras are adapted to acquire an image of the object.

6. Claim 5

a. The handheld device of claim 1 wherein the second camera is adapted to acquire a video of the object.

Liebermann discloses this limitation for the reasons discussed *supra* in Sections V.A.6 and V.G.2. Regardless of the object that is acquired, *supra* Sections V.A.5, V.G.2, *Liebermann* discloses the cameras are adapted to acquire a video of the object.

7. Claim 6

a. The handheld device of claim 1 wherein the computer is operable to determine a gesture based on at least one of the first camera output and the second camera output.

The analysis above for limitations [1.c] and [1.e] explain how and why it would have been obvious for the computer in the modified cellular telephone to be operable to determine a gesture based on camera images like that claimed here ("computer is operable to determine a gesture based on at least one of the first camera output and the second camera output"). (*Supra* Sections V.G.2.c, V.G.2.e (explaining how the "computer" in the modified *Liebermann* cellular phone would have been operable to perform a control function of the handheld device based on at least one of the first camera output and the second camera output).) Such operations would have included determining a gesture based on camera outputs because the *Liebermann* computer—as modified— processes camera data for gestures to determine when to turn off, stop operating, take a picture, etc. (*Supra* Section V.G.2.e.) As explained, *Sears* discloses that main system computer 35 analyzes camera images for gestures. (*Id.*) When the computer detects a specific command gesture using the camera(s), various control functions of the device (turn off, stop operating, take a picture, etc.) are triggered. (*Id.*) The *Sears* computer teachings modify *Liebermann* such that the cellular telephone computer—upon detecting a gesture—can perform a control function of the handheld device based on at least one of the first camera output and the second camera output. (*Id.*) Indeed, the gesture control is based off at least one camera output because the cameras sense the gestural

inputs. (*Id.* (explaining how cameras sense gestures and the system responds to various gestures); *see also* Ex. PA-1, 6:6-6:10 (describing how hand gestures "captured by the camera are converted into digital data for processing"); *id.*, 13:4-16 (suggesting a multiple camera embodiment); Ex. PA-2, 22:5-8 ("[I]n these embodiments, the camera received commands, at least in part, from hand and finger gestures of the user that were captured by the camera or cameras."); *id.*, 5:44-6:10, 6:52-7:2 (explaining that main system 35 analyzes camera images to determine when various "gestures" have been performed); 10:29-11:15 (describing various gestures that can control the system).)

Likewise, the *Liebermann-Sears* combination discloses or suggests that the claimed "gesture" under Requester's construction discussed above (*supra* Section IV.C), i.e., a sequence of positions that conveys a meaning, as the various "finger and hand motions" to convey sign language, which are detected in addition to *Sears* hand gesture controls, Ex. PA-1, 6:4-47; *id.*, 12:30-36 (referring to hand signs as "gesture[s]"); *supra* Section V.G.2, are gestures.

Likewise, the *Liebermann-Sears* combination discloses or suggests the claimed "gesture" under the district court's construction discussed above (*supra* Section IV.C), i.e., movement of hands or other body parts that conveys meaning, as the various "finger and hand motions" to convey sign language, which are detected in addition to *Sears* hand gesture controls, Ex. PA-1, 6:4-47; *id.*, 12:30-36 (referring to hand signs as "gesture[s]"); *supra* Section V.G.2, are gestures. Thus, *Liebermann* in view of *Sears* discloses or suggests this limitation under the Requester's proposed construction, the meaning proposed by PO, and the meaning found by the district court. (*See* Section IV.)

        8.   **Claim 7**

                a.   **The handheld device of claim 1 wherein the computer is operable to determine a facial expression based on at least one of the first camera output and the second camera output.**

Liebermann in view of *Sears* discloses "the computer is operable to determine a facial expression based on at least one of the first camera output and the second camera output." (Ex. PA-DEC, ¶ 168.) In one embodiment, "**images captured by the camera are of the . . . facial expressions**" of a user. (Ex. PA-1, 6:42-47 (emphasis added).) And the facial expressions of a hearing challenged user are analyzed to determine raised eyebrow facial expressions, teeth exposed facial expressions, etc. *(Id.,* 8:30-9:22; Ex. PA-DEC, ¶ 168.) Accordingly, the computer in the

modified *Liebermann* cellular phone (which performs network processing locally as explained above) would have been operable to perform such processing locally, and thus determine a facial expression based on at least one of the first or second camera output discussed above. (*Supra* Section V.G.2; Ex. PA-DEC, ¶ 168.)

9.   Claim 8

> **a.   The handheld device of claim 1 wherein the computer is adapted to determine at least one of the position and the orientation of the object based on the second camera output.**

To the extent *Liebermann* does not disclose or suggest this limitation, it would have been obvious to configure the computer in the modified *Liebermann* cellular phone to be adapted to determine at least one of the position and the orientation of the object based on the second camera output. (Ex. PA-DEC, ¶ 169-73.)

The '924 patent explains that objects include persons, hands, and fingers. (Ex. PAT-A, 3:52-54 (emphasis added) ("[C]amera 144 can be used for other purposes, such as acquire images of **objects such as persons.**"); Ex. PAT-D, 1:67-2:2 (incorporated into the '924 patent by reference) (emphasis added) ("cameras according to the invention located on the keyboard surface to observe **objects such as fingers and hands**").)

When a second person controls the *Sears* device with gestures, the system determines the position and/or orientation of a finger object. (Ex. PA-DEC, ¶ 171.) Like *Liebermann*, *Sears* also discloses that multiple cameras can track user gestures. (Ex. PA-2, 22:5-8 ("Furthermore, in these embodiments, the camera received commands, at least in part, from hand and finger gestures of the user that were captured by the camera or cameras.").) *Sears* further discloses that multiple persons can control the device with gestures. (*Id.*, 6:34 (disclosing that "[m]any users" can use the system).) And *Sears* discloses that the main system computer determines the "position" and/or "orientation" of a finger object when determining whether a gesture has been made. (*Id.*, 5:54-61 ("[I]n the second mode, the image is analyzed for the presence, orientation and movement of a pointer object (e.g. a finger 34, shown in FIG. 1) which is under the influence of the user and which is located on top of the printed material 33, in a pointer tracking step 57."); *id.*, 13:48-51 ("Control for this feedback is provided in a feedback generation step 65, which accepts input from pointer tracking 57 and text selection 59, which contain information about the position and movement of

the finger 34."); *id.*, 17:55-58 ("Once the user's hand or finger is identified using algorithms previously described, the hand can be tracked until a command is received, either through hand movement, finger orientation or position, or other input modality."); *see also supra* Section V.G.2.c (explaining how the computer determines gestures based on camera images).) So when a second person other than the user makes a gesture, a POSITA would have understood that the computer determines the position and/or orientation of a finger object. (Ex. PA-DEC, ¶ 171.)

It would have been obvious before the time of invention to have the system computer be adapted to determine at least one of the position and the orientation of the object based on the second camera output. (Ex. PA-DEC, ¶ 172.) Given that *Liebermann* and *Sears* disclose and/or suggest using two cameras to sense gestures, Ex. PA-1, 13:4-7 ("The illustrated embodiments all utilize a single video cameras. It may be desirable to utilize more than one camera to allow the signing person 'free' movement in his or her environment."); Ex. PA-2, 22:5-8, a POSITA would have appreciated that the exact algorithm used for gesture detection was a design choice motivated by needs for "accura[cy]," "computing resources," and/or other tradeoffs. (Ex. PA-2, 9:19-26.) Here a POSITA would have been motivated to use the specific gesture detecting algorithm disclosed by *Sears* for the benefits associated therewith. (Ex. PA-DEC, ¶ 172.) Further, a POSITA would have been motivated to use the *Sears* gesture-detecting algorithm as claimed because it would have increased user convenience by allowing persons to control the device with natural gestures. (*Supra* Section V.G.2.e.) A POSITA would have had a reasonable expectation of success in such an implementation because the combination would have involved known technologies (e.g., devices with multiple cameras) according to known methods (e.g., using various algorithms to recognize hand gestures) to yield the predictable result of a device with two cameras that sense gestures. (Ex. PA-DEC, ¶ 172.) *See KSR Intern. Co. v. Teleflex Inc.*, 550 U.S. 398, 416 (2007).

Likewise, the *Liebermann-Sears* combination discloses that the claimed "computer is adapted to" perform identified functions under Requester's construction discussed above (*supra* Section IV.B, D), i.e., software running on a computer that is programmed to perform the claimed function or equivalents thereof, for the same reasons discussed herein. (*Supra* Sections V.A.2.e and V.G.2.e.) Thus, *Liebermann* in view of *Sears* discloses or suggests this limitation under both the Requester's proposed constructions, and the plain meaning proposed by PO and found by the district court. (*See* Section IV.)

      10.   **Claim 10**

> **a.   The handheld device of claim 1 wherein the computer is adapted to recognize the object based on the second camera output.**

Liebermann in view of *Sears* discloses and/or suggests this limitation. (Ex. PA-DEC, ¶ 177.) As modified, the computer of the cellular telephone senses and distinguishes among a variety of different types of user gestures. (*Supra* Section V.G.2.) Further, the second camera is oriented to view objects (including the fingers and hands of another person). (*Supra* Section V.G.2.e.) When the computer distinguishes a first hand gesture object from another gesture based on data from the second camera, a POSITA would have understood that the computer is adapted to recognize the hand object as a hand making a specific gesture. (Ex. PA-1, 6:4-10 ("[C]amera lens 10 will record the signing movement of the hands and fingers and body and facial motions and expressions. The signing motions captured by the camera are converted into digital data for processing by the translation software, (i.e., artificial intelligence) to produce data representing numbers, words and phrases which are then combined into coherent sentences."); Ex. PA-2, 10:29-30, 11:7-9, 15:47-56 (explaining that a variety of hand gestures can control the system); Ex. PA-DEC, ¶ 177.) Accordingly, the computer in the modified *Liebermann* cellular phone would have been adapted to recognize the object based on the second camera output, as claimed.

Likewise, the *Liebermann-Sears* combination discloses that the claimed "computer is adapted to" perform identified functions under Requester's construction discussed above (*supra* Section IV.B, D), i.e., software running on a computer that is programmed to perform the claimed function or equivalents thereof, for the same reasons discussed herein. (*Supra* Sections V.A.2.e and V.G.2.e.) Thus, *Liebermann* in view of *Sears* discloses or suggests this limitation under both the Requester's proposed constructions, and the plain meaning proposed by PO and found by the district court. (*See* Section IV.)

> **11.   Claim 12**

> **a.   The handheld device of claim 1 wherein the computer is adapted to determine a reference frame of the object.**

Liebermann in view of *Sears* discloses and/or suggests this limitation for the reasons discussed *supra* in Sections V.D.11 and V.G.2. Specifically, *Liebermann* discloses two ways to determine a reference frame of the object, *supra* Section V.D.1, and the *Sears* modification

specifies that the computer is located on the cellular telephone, *supra* Section V.G.2.   Thus, a POSITA would have found it obvious for the same reasons explained above to configure the computer in the modified *Liebermann* cellular phone to be adapted to determine a reference frame of the object, as claimed.

Likewise, the *Liebermann-Sears* combination discloses that the claimed "computer is adapted to" perform identified functions under Requester's construction discussed above (*supra* Section IV.B, D), i.e., software running on a computer that is programmed to perform the claimed function or equivalents thereof, for the same reasons discussed herein. (*Supra* Sections V.A.2.e and V.G.2.e.) Thus, *Liebermann* in view of *Sears* discloses or suggests this limitation under both the Requester's proposed constructions, and the plain meaning proposed by PO and found by the district court. (*See* Section IV.)

12.   **Claim 13**

a.   **The handheld device of claim 1 wherein the computer is adapted to perform a control function based on the first camera output and based on the second camera output.**

To the extent *Liebermann* does not disclose or suggest this limitation, *supra* Section V.A.7, *Liebermann* in view of *Sears* suggests this limitation. (Ex. PA-DEC, ¶ 181.) For instance, both cameras in *Liebermann* may be used to sense user gestures in the modified system. (*Supra* Section V.G.2.e; Ex. PA-2, 22:5-8 ("Furthermore, in these embodiments, the camera received commands, at least in part, from hand and finger gestures of the user that were captured by the camera or cameras.").) And based on the outputs of the gesture-detecting cameras, the computer in the modified *Liebermann* would have been configured to perform a variety of control functions based on such camera outputs. (*Supra* Section V.G.2.e.) Accordingly, for the reasons explained, the computer in the modified *Liebermann* cellular phone would have been adapted to perform a control function based on the first camera output and based on the second camera output, as claimed.

Likewise, the *Liebermann-Sears* combination discloses that the claimed "computer is adapted to" perform identified functions under Requester's construction discussed above (*supra* Section IV.B, D), i.e., software running on a computer that is programmed to perform the claimed function or equivalents thereof, for the same reasons discussed herein. (*Supra* Sections V.A.2.e and V.G.2.e.) Thus, *Liebermann* in view of *Sears* discloses or suggests this limitation under both

the Requester's proposed constructions, and the plain meaning proposed by PO and found by the district court. (*See* Section IV.)

H.   SNQ8: *Liebermann* in view of *Sears* and *Tryding*

1.   Claim 11

a.   The handheld device of claim 1 wherein the computer is adapted to generate control instructions for a display that is separate from the handheld device.

Liebermann in view of *Sears* and *Tryding* discloses and/or suggests this limitation for the reasons discussed *supra* in Sections V.B and V.G.2. The analysis for modifying *Liebermann* in light of *Tryding* (Section V.B) are applicable to the modified *Liebermann-Sears* combination discussed above for claim 1 (Section V.G.2). Thus, given that the computer in the modified *Liebermann-Sears* cellular phone would have controlled the cellular telephone, *supra* Section V.G.2; Ex. PA-DEC, ¶ 184, a POSITA would have been motivated to configure the computer such that it is adapted to perform the display function, like that described by *Tryding*, for the reasons discussed. (Ex. PA-DEC, ¶ 184.)

I.   SNQ9: *Liebermann* in view of *Sears* and *Gershman*

1.   Claim 14

a.   The handheld device of claim 1 wherein the computer is adapted to transmit information over an internet connection.

Liebermann in view of *Sears* and *Gershman* discloses and/or suggests this limitation for the reasons discussed *supra* in Sections V.C and V.G.2. The analysis for modifying *Liebermann* in light of *Gershman* (Section V.C) are applicable to the modified *Liebermann-Sears* combination discussed above for claim 1 (Section V.G.2). Thus, given that the computer in the modified *Liebermann* cellular phone would have controlled the cellular telephone, *supra* Section V.G.2; Ex. PA-DEC, ¶ 186, a POSITA would have been motivated to configure the computer such that it is adapted to transmit information over an internet connection, like that described by *Gershman*. (Ex. PA-DEC, ¶ 186.)

J.   SNQ10: *Liebermann* in view of *Kimball*

As explained below and in the attached declaration of Dr. Abowd (Ex. PA-DEC), *Liebermann* and *Kimball* disclose or suggest the limitations of claim 14 of the '924 patent. (Ex. PA-DEC, ¶ 187.)

1.   Overview of *Kimball*

Kimball relates to mobile telephones, and more particularly to using a mobile phone to connect to the internet. (Ex. PA-11, 1:6-9 "The present invention pertains to the field of telephones. More particularly, this invention relates to a cellular telephone that includes functionality for performing both cellular telephone calls and Internet telephone calls.").) Thus, *Kimball* is in the same or similar technical field as *Liebermann* and the '924 patent, and a POSITA would have had reason to consider the teachings of *Kimball* when implementing the *Liebermann* system. (*Supra* Section V.A; Ex. PA-DEC, ¶ 52.) To the extent *Kimball* is not within the field of endeavor of the '924 patent (it is), *Kimball* is reasonably pertinent to problems associated with communicating information over the internet. (Ex. PA-11, 1:33-53; Ex. PAT-A, 23:38-42 ("The invention provides . . . all of the benefits of the video and computer revolution, also via the internet."); Ex. PA-DEC, ¶¶ 52.)

2.   Claim 14

a.   The handheld device of claim 1 wherein the computer is adapted to transmit information over an internet connection.

While not expressly disclosed, a POSITA would have found it obvious to adapt a computer of a cellular telephone (such as the *Liebermann* computer) to transmit information over an internet connection in view of *Kimball*. (Ex. PA-DEC, ¶ 188.) For example, *Kimball* discloses a wireless phone that is adapted to transmit information over an internet connection. (Ex. PA-11, Abstract ("A cellular telephone that provides the capability of performing Internet telephone calls without the bulk and expense of Internet telephone computer systems."); *id.*, 6:51-55, FIG. 4.) Specifically, *Kimball* describes how conventional cell phone hardware could be programmed with "internet telephony code" to make or receive internet calls, communicate data packets, etc. over a cellular transceiver. (*Id.*, 7:14-23 ("FIG. 5 illustrates the software elements of the cellular telephone 10 in one embodiment. The software elements includes cellular telephony code 60 that provides the functionality of the cellular call subsystem 20 and Internet telephony code 62 that provides the

functionality of the Internet call subsystem 22. The Internet telephony code 62 may be added to an existing cellular telephone 10 to provide Internet telephone functionality without requiring hardware upgrades to the cellular telephone 10."); *id.*, 2:62-64, FIGs. 2A-C (describing various data packets that are communicated over the internet via a cell phone); *id.*, FIG. 4 (illustrating that the cellular telephone includes processor 50 and a transceiver).)
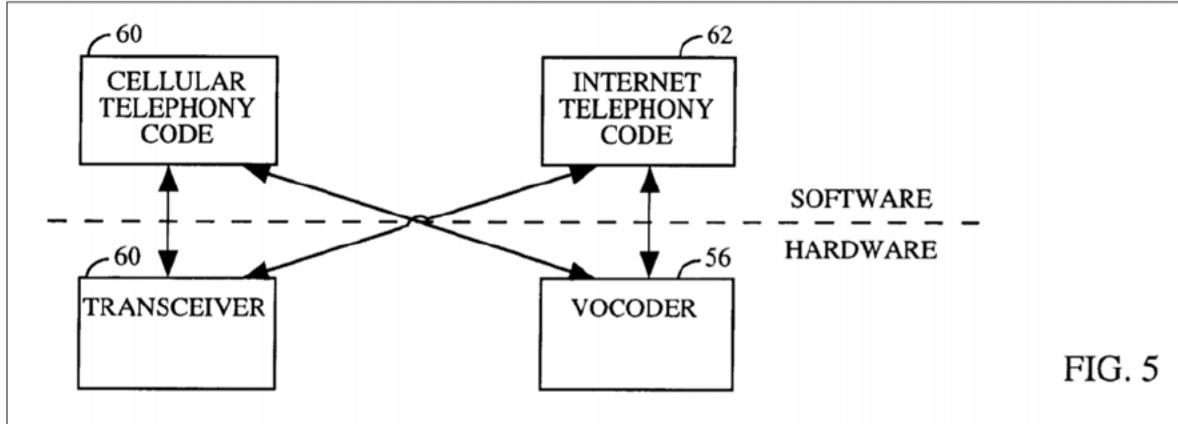
(*Id.*, FIG. 5 (illustrating the "internet telephony code" software 62 that allows a cell phone to communicate over the internet).)

It would have been obvious before the time of invention to have the *Liebermann* cellular telephone computer perform an internet communication as claimed. As explained above, computer hardware of the *Liebermann* cellular telephone operates the device, controls displays, communicates data, etc. (*Supra* Section V.A.2.c.) So the internet communication software described by *Kimball* would have been processed on the *Liebermann* computer to communicate over an internet connection (as the software of a device is executed on the hardware of the device). (Ex. PA-11, 7:19-23 ("The Internet telephony code 62 may be added to an existing cellular telephone 10 to provide Internet telephone functionality without requiring hardware upgrades to the cellular telephone 10."); Ex. PA-DEC, ¶ 189.)

A POSITA would have been motivated to include internet access capability when implementing a cellular phone similar to as disclosed in *Liebermann* such that the computer in the cellular phone is adapted to transmit information over the internet connection. (Ex. PA-DEC, ¶ 190.) For instance, a POSITA would have been motivated to modify *Liebermann* to communicate calls over the internet as claimed because consumers desired the flexibility and convenience associated with internet calling. (Ex. PA-11, 1:9-53.) *Liebermann* describes a cellular telephone that communicates data to make a call, Ex. PA-1, 7:21-28, and *Kimball* suggests a beneficial way

of communicating data over the internet to make a call, Ex. PA-11, 1:9-53, 7:21-28. Additionally, using the software techniques disclosed by *Kimball* would have reduced the size and costs associated with communicating data over the internet. (Ex. PA-11, 1:9-53.) Further, persons of ordinary skill in the art understood that consumers wanted devices that could connect to the internet before the time of invention and would have been motivated to include the claimed internet feature for similar reasons. (Ex. PA-DEC, ¶ 190.) Indeed, such a skilled person would have been motivated to include an internet connection at least because it could conveniently and quickly communicate various data on demand. (Ex. PA-DEC, ¶ 190.)

A POSITA would have had a reasonable expectation of success in implementing Internet access in a cellular phone computer. (Ex. PA-DEC, ¶ 191.) Indeed, *Kimball* discloses that communicating information over an internet connection of a cell phone required no more than appropriate programming. (Ex. PA-11, 7:14-23.) Furthermore, such an implementation would have involved a combination of known technologies (e.g., as in *Liebermann* and *Kimball*) according to known methods (e.g., known processes to transmit information over the Internet) to yield a predictable cell phone computer that is adapted to transmit information over an internet connection. (Ex. PA-DEC, ¶ 191.) *See KSR Intern. Co. v. Teleflex Inc.*, 550 U.S. 398, 416 (2007).

Finally, the *Liebermann-Kimball* combination likewise discloses that "the computer is adapted to perform" the claimed control function under Requester's construction discussed above, i.e., software running on a computer that is programmed to perform the claimed function or equivalents thereof, for the same reasons and as discussed above in *supra* Section V.A.2.e. (*Supra* Section V.A.2.e (explaining how the *Liebermann* cellular telephone computer is programmed with software to operate); Ex. PA-DEC, ¶ 192.) Further, *Kimball* discloses that communicating information over an internet connection of a cell phone as claimed required no more than appropriate software programming. (Ex. PA-11, 7:14-23.) Thus, *Liebermann* in view of *Kimball* discloses or suggests this limitation under both the Requester's proposed constructions, and the plain meaning proposed by PO and found by the district court. (*See supra* Section IV; Ex. CC-2.)

K. SNQ11: *Liebermann* in view of *Himmel* and *Kimball*

1. Claim 14

a. The handheld device of claim 1 wherein the computer is adapted to transmit information over an internet connection.

Liebermann in view of *Himmel* and *Kimball* discloses and/or suggests this limitation for the reasons discussed *supra* in Sections V.K and V.D.2. The analysis for modifying *Liebermann* in light of *Kimball* (Section V.K) is applicable to the modified *Liebermann-Himmel* combination discussed above for claim 1 (Section V.D.2). Thus, given that the computer in the modified *Liebermann* cellular phone would have controlled the cellular telephone, *supra* Section V.D.2; Ex. PA-DEC, ¶ 194, a POSITA would have been motivated to configure the computer such that it is adapted to transmit information over an internet connection, like that described by *Kimball*. (Ex. PA-DEC, ¶ 194.)   Thus, *Liebermann* in view of *Himmel* and *Kimball* discloses or suggests this limitation under both the Requester's proposed constructions, and the plain meaning proposed by PO and found by the district court. (*See supra* Section IV; Ex. CC-2.)

L.   SNQ12: *Liebermann* in view of *Sears* and *Kimball*

1.   Claim 14

a.   The handheld device of claim 1 wherein the computer is adapted to transmit information over an internet connection.

Liebermann in view of *Sears* and *Kimball* discloses and/or suggests this limitation for the reasons discussed *supra* in Sections V.K and V.G.2. The analysis for modifying *Liebermann* in light of *Kimball* (Section V.K) is applicable to the modified *Liebermann-Sears* combination discussed above for claim 1 (Section V.G.2). Thus, given that the computer in the modified *Liebermann* cellular phone would have controlled the cellular telephone, *supra* Section V.G.2; Ex. PA-DEC, ¶ 196, a POSITA would have been motivated to configure the computer such that it is adapted to transmit information over an internet connection, like that described by *Kimball*. (Ex. PA-DEC, ¶ 196.)   Thus, *Liebermann* in view of *Sears* and *Kimball* discloses or suggests this limitation under both the Requester's proposed constructions, and the plain meaning proposed by PO and found by the district court. (*See supra* Section IV; Ex. CC-2.)

M.   SNQ13: *Liebermann* in view of *Himmel*

1.   Claim 9

a.   The handheld device of claim 6 wherein the gesture is performed by a person other than the user of the handheld

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device.

As explained, the district court in the *GTP v. Samsung* litigation found the term "wherein the gesture is performed by a person other than the user of the handheld device" indefinite. (*See supra* Section IV; Ex. CC-2, 48-50.) As also explained, while the district court found this term indefinite, and thus claim 9 indefinite, Requester presents this SNQ separately for claim 9 under the assumption that the Office does not agree with the district court that the above term is indefinite to preclude a finding of a SNQ for claim 9. Indeed, although the district court correctly analyzed claim 9, PO has argued that claim 9 meets the requirements of 35 U.S.C. § 112 (Ex. CC-1, 18; Ex. CC-2, 48-50).   Thus, for purposes of this SNQ, Requester demonstrates how the prior art discloses/suggests the limitations of claim 9 under PO's position and to the extent the Office does not agree with the district court's findings.   In such instance, the terms in claim 9 not expressly agreed upon by the parties or construed by the district court, are interpreted under their plain meanings based on the words of the claim. As noted, to the extent the Office determines that issues associated with the above-identified term precludes it from determining the scope of claim 9 to support a finding of a SNQ as to claim 9 (as proposed herein) for reasons similar to those presented by the district court (Ex. CC-2, 48-50), such denial (e.g. a finding against SNQ 13) would not preclude reexamination of the other claims challenged in the SNQs presented (*see e.g.,* Sections V.A-L (SNQs 1-11).)

Under the above assumptions, *Liebermann* in view of *Himmel* discloses and/or suggests the limitations of claims 1 and 6 from which claim 9 depends. As discussed above in claims 1 and 6, the *Liebermann-Himmel* combination suggests the claimed two-camera system that responds to user gestures. (*Supra* Section V.D.7 (claim 6); Section V.D.2 (claim 1).)

As to claim 9, *Liebermann* discloses that the device can be used by multiple persons. (Ex. PA-1, 13:4-23 ("[a] defined Figure with signing motions . . . is rendered in conformity with allowable images (for **persons**).").) A POSITA would have understood that the cellular telephone could accept signing gestures from multiple persons, including a person not the user of the device. (*Id.*, 12:30-36 (referring to hand signs as "gesture[s]"); Ex. PA-DEC, ¶ 199.) Moreover, a POSITA would have understood that a user could hold the phone to image a signing person who is not the user of the phone. (Ex. PA-DEC, ¶ 199.)

Moreover, the requirement that the "gesture is performed by a person other than the user of the handheld device" should not be given patentable weight because the manner of operating a

device does not differentiate an apparatus claim from the prior art. Indeed, a claim containing a "recitation with respect to the manner in which a claimed apparatus is intended to be employed does not differentiate the claimed apparatus from a prior art apparatus" if the prior art apparatus teaches all the structural limitations of the claim. *Ex parte Masham*, 2 U.S.P.Q.2d 1647 (Bd. Pat. App. & Inter. 1987); *see also ParkerVision, Inc. v. Qualcomm Inc.*, 903 F.3d 1354, 1361 (Fed. Cir. 2018) ("[A] prior art reference may anticipate or render obvious an apparatus claim . . . if the reference discloses an apparatus that is reasonably capable of operating so as to meet the claim limitations, even if it does not meet the claim limitations in all modes of operation.").

Likewise, the *Liebermann-Himmel* combination discloses that the claimed "computer is adapted to" perform identified functions under Requester's construction discussed above (*supra* Section IV.B, D), i.e., software running on a computer that is programmed to perform the claimed function or equivalents thereof, for the same reasons discussed herein. (*Supra* Sections V.A.2.e and V.D.2.e.).

Likewise, the *Liebermann-Himmel* combination discloses or suggests the claimed "gesture" under Requester's construction discussed above (*supra* Section IV.C), i.e., a sequence of positions that conveys a meaning, as the various "finger and hand motions" to convey sign language, Ex. PA-1, 6:4-47; *id.*, 12:30-36 (referring to hand signs as "gesture[s]"), are gestures.

Likewise, the *Liebermann-Himmel* combination discloses or suggests the claimed "gesture" under the district court's construction discussed above (*supra* Section IV.C), i.e., movement of hands or other body parts that conveys meaning, as the various "finger and hand motions" to convey sign language, Ex. PA-1, 6:4-47; *id.*, 12:30-36 (referring to hand signs as "gesture[s]"), are gestures. Thus, *Liebermann* in view of *Himmel* discloses or suggests these limitations under the Requester's proposed constructions, the meanings proposed by PO, and the meanings found by the district court. (*See* Section IV.)

N.   SNQ14: *Liebermann* in view of *Sears*

1.   Claim 9

> **a.   The handheld device of claim 6 wherein the gesture is performed by a person other than the user of the handheld device.**

As explained, the district court in the *GTP v. Samsung* litigation found the term "wherein the gesture is performed by a person other than the user of the handheld device" indefinite. (*See supra* Section IV; Ex. CC-2, 48-50.) As also explained, while the district court found this term indefinite, and thus claim 9 indefinite, Requester presents this SNQ separately for claim 9 under the assumption that the Office does not agree with the district court that the above term is indefinite to preclude a finding of a SNQ for claim 9. Indeed, although the district court correctly analyzed claim 9, PO has argued that claim 9 meets the requirements of 35 U.S.C. § 112 (Ex. CC-1, 18; Ex. CC-2, 48-50).   Thus, for purposes of this SNQ, Requester demonstrates how the prior art discloses/suggests the limitations of claim 9 under PO's position and to the extent the Office does not agree with the district court's findings.   In such instance, the terms in claim 9 not expressly agreed upon by the parties or construed by the district court, are interpreted under their plain meanings based on the words of the claim. As noted, to the extent the Office determines that issues associated with the above-identified term precludes it from determining the scope of claim 9 to support a finding of a SNQ as to claim 9 (as proposed herein) for reasons similar to those presented by the district court (Ex. CC-2, 48-50), such denial (e.g. a finding against SNQ 13) would not preclude reexamination of the other claims challenged in the SNQs presented (*see e.g.,* Sections V.A-L (SNQs 1-11).)

Liebermann in view of *Sears* discloses and/or suggests the limitations of claims 1 and 6 from which claim 9 depends. As discussed above in claims 1 and 6, the *Liebermann-Sears* combination suggests the claimed two-camera system that responds to user gestures. (*Supra* Section V.G.7 (claim 6); Section V.G.2 (claim 1).)

In addition to the *Lieberamnn-Himmel* combination that renders claim 9 obvious, claim 9 would have been obvious in view of *Liebermann* and *Sears*. As explained above, *Liebermann* discloses that the device can be used by multiple persons. (Ex. PA-1, 13:4-23 ("[a] defined Figure with signing motions . . . is rendered in conformity with allowable images (for **persons**).").) Similarly, a POSITA would have understood that the cellular telephone could accept signing gestures from multiple persons, including a non-user person operating the device. (*Id.*, 12:30-36 (referring to hand signs as "gesture[s]"); Ex. PA-DEC, ¶ 205.) Further, a POSITA would have understood that a user could hold the phone to image a signing person who is not the user of the phone. (Ex. PA-DEC, ¶ 205.) Moreover, *Sears* discloses that multiple persons can control the device with gestures. (Ex. PA-2, 6:34 (disclosing that "[m]any users" can use the system).) A

POSITA would have thus been motivated to configure the *Liebermann-Sears* cellular phone to detect gestures from multiple users to benefit from the convenience associated with having multiple persons being able to input signing gestures. (Ex. PA-DEC, ¶ 205.) A POSITA would have had a reasonable expectation of success in such implementation, given it would have involved known technologies (e.g., hardware for recognizing hand gestures from persons) according to known methods (e.g., recognizing hand gestures from persons) to yield the predictable result of a gesture being performed by a person other than the user of the handheld device. (Ex. PA-DEC, ¶ 205.) *See KSR Intern. Co. v. Teleflex Inc.*, 550 U.S. 398, 416 (2007).

Further, the requirement that the "gesture is performed by a person other than the user of the handheld device" should not be given patentable weight because the manner of operating a device does not differentiate an apparatus claim from the prior art. Indeed, a claim containing a "recitation with respect to the manner in which a claimed apparatus is intended to be employed does not differentiate the claimed apparatus from a prior art apparatus" if the prior art apparatus teaches all the structural limitations of the claim. *Ex parte Masham*, 2 U.S.P.Q.2d 1647 (Bd. Pat. App. & Inter. 1987); *see also ParkerVision, Inc. v. Qualcomm Inc.*, 903 F.3d 1354, 1361 (Fed. Cir. 2018) ("[A] prior art reference may anticipate or render obvious an apparatus claim . . . if the reference discloses an apparatus that is reaso0nably capable of operating so as to meet the claim limitations, even if it does not meet the claim limitations in all modes of operation.").

Thus, the *Liebermann-Sears* combination discloses and/or suggests claim 9.

Likewise, the *Liebermann-Sears* combination discloses that the claimed "computer is adapted to" perform identified functions under Requester's construction discussed above (*supra* Section IV.B, D), i.e., software running on a computer that is programmed to perform the claimed function or equivalents thereof, for the same reasons discussed herein. (*Supra* Sections V.A.2.e and V.G.2.e.).

Likewise, the *Liebermann-Sears* combination discloses or suggests the claimed "gesture" under Requester's construction discussed above (*supra* Section IV.C), i.e., a sequence of positions that conveys a meaning, as the various "finger and hand motions" to convey sign language, which are detected in addition to *Sears* hand gesture controls, Ex. PA-1, 6:4-47; *id.*, 12:30-36 (referring to hand signs as "gesture[s]"); *supra* Section V.G.2, are gestures.

Likewise, the *Liebermann-Sears* combination discloses or suggests the claimed "gesture" under the district court's construction discussed above (*supra* Section IV.C), i.e., movement of

hands or other body parts that conveys meaning, as the various "finger and hand motions" to convey sign language, which are detected in addition to *Sears* hand gesture controls, Ex. PA-1, 6:4-47; *id.*, 12:30-36 (referring to hand signs as "gesture[s]"); *supra* Section V.G.2, are gestures. Thus, *Liebermann* in view of *Sears* discloses or suggests these limitations under the Requester's proposed constructions, the meanings proposed by PO, and the meanings found by the district court. (*See* Section IV.)

VI.   Detailed Explanation of the Pertinence and Manner of Applying the Prior Art to the Claims

A.   Bases for Proposed Rejections of the Claims

The following is a quotation of pre-AIA 35 U.S.C. § 102 that forms the basis for all of the identified prior art:

> A person shall be entitled to a patent unless . . .
>
> (e) the invention was described in — (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for the purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language . . . .

The following is a quotation of pre-AIA 35 U.S.C. § 103(a) that forms the basis of all of the following obviousness rejections:

> A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negative by the manner in which the invention was made.

The question under 35 U.S.C. § 103 is whether the claimed invention would have been obvious to one of ordinary skill in the art at the time of the invention. In *KSR International Co. v. Teleflex Inc.*, 550 U.S. 398 (2007), the Court mandated that an obviousness analysis allow for "common sense" and "ordinary creativity," while at the same time not requiring "precise teachings

directed to the specific subject matter of the challenged claim[s]." *KSR Int'l Co.*, 550 U.S. at 418, 420-421. According to the Court, "[t]he combination of familiar elements according to known methods is likely to be obvious when it does no more than yield predictable results." *Id.* at 416. In particular, the Court emphasized "the need for caution in granting a patent based on the combination of elements found in the prior art." *Id.* at 401. The Court also stated that "when a patent simply arranges old elements with each performing the same function it had been known to perform and yields no more than one would expect from such an arrangement, the combination is obvious." *Id.* at 417.

The Office has provided further guidance regarding the application of *KSR* to obviousness questions before the Office.

> If a person of ordinary skill can implement a predictable variation, § 103 likely bars its patentability. For the same reason, if a technique has been used to improve one device, and a person of ordinary skill in the art would recognize that it would improve similar devices in the same way, using the technique is obvious unless its actual application is beyond his or her skill.

MPEP § 2141(I) (quoting *KSR* at 417.)

The MPEP identifies many exemplary rationales from *KSR* that may support a conclusion of obviousness. Some examples that may apply to this reexamination include:

- Combining prior art elements according to known methods to yield predictable results;

- Simple substitution of one known element for another to obtain predictable results;

- Use of a known technique to improve similar devices in the same way;

- Applying a known technique to improve devices in the same way;

- Choosing from a finite number of identified, predictable solutions, with a reasonable expectation of success ("obvious to try")

MPEP § 2141(III).

In addition, the Office has published *Post-KSR* Examination Guideline Updates. *See* Fed. Reg. Vol. 75, 53464 (the "Guideline Updates"). The Guideline Updates discuss developments after *KSR* and provide teaching points from recent Federal Circuit decisions on obviousness. Some examples are listed below:

> A claimed invention is likely to be obvious if it is a combination of known prior art elements that would reasonably have been expected

> to maintain their respective properties or functions after they have been combined.

Id. at 53646.

> A combination of known elements would have been prima facie obvious if an ordinary skilled artisan would have recognized an apparent reason to combine those elements and would have known how to do so.

Id. at 53648.

> Common sense may be used to support a legal conclusion of obviousness so long as it is explained with sufficient reasoning.

Id.

B.   Proposed Rejections

Pursuant to 37 C.F.R. § 1.510(b)(2), Requester identifies claims 1-14 as the claims for which reexamination is requested. The proposed rejections below, in conjunction with the analysis in Sections IV-V above and the attached declaration of Dr. Abowd (Ex. PA-DEC), provide a detailed explanation of the pertinence and manner of applying the prior art to each of claims 1-14.

1.   Proposed Rejection #1

Claims 1-5 and 13 are obvious over *Liebermann* in view of the knowledge of a POSITA under 35 U.S.C. § 103(a), as shown by the discussion above in Section V.A and the declaration of Dr. Abowd provided in Exhibit PA-DEC.

2.   Proposed Rejection #2

Claim 11 is obvious over *Liebermann* in view of *Tryding* under 35 U.S.C. § 103(a), as shown by the discussion above in Section V.B and the declaration of Dr. Abowd provided in Exhibit PA-DEC.

3.   Proposed Rejection #3

Claim 14 is obvious over *Liebermann* in view of *Gershman* under 35 U.S.C. § 103(a), as shown by the discussion above in Section V.C and the declaration of Dr. Abowd provided in Exhibit PA-DEC.

4.   Proposed Rejection #4

Claims 1-8, 10, and 12-13 are obvious over *Liebermann* in view of *Himmel* under 35 U.S.C. § 103(a), as shown by the discussion above in Section V.D and the declaration of Dr. Abowd provided in Exhibit PA-DEC.

5.   Proposed Rejection #5

Claim 11 is obvious over *Liebermann* in view of *Himmel* and *Tryding* under 35 U.S.C. § 103(a), as shown by the discussion above in Section V.E and the declaration of Dr. Abowd provided in Exhibit PA-DEC.

6.   Proposed Rejection #6

Claim 14 is obvious over *Liebermann* in view of *Himmel* and *Gershman* under 35 U.S.C. § 103(a), as shown by the discussion above in Section V.F and the declaration of Dr. Abowd provided in Exhibit PA-DEC.

7.   Proposed Rejection #7

Claims 1-8, 10, and 12-13 are obvious over *Liebermann* in view of *Sears* under 35 U.S.C. § 103(a), as shown by the discussion above in Section V.G and the declaration of Dr. Abowd provided in Exhibit PA-DEC.

8.   Proposed Rejection #8

Claim 11 is obvious over *Liebermann* in view of *Sears* and *Tryding* under 35 U.S.C. § 103(a), as shown by the discussion above in Section V.H and the declaration of Dr. Abowd provided in Exhibit PA-DEC.

9.   Proposed Rejection #9

Claim 14 is obvious over *Liebermann* in view of *Sears* and *Gershman* under 35 U.S.C. § 103(a), as shown by the discussion above in Section V.I and the declaration of Dr. Abowd provided in Exhibit PA-DEC.

10.   Proposed Rejection #10

Claim 14 is obvious over *Liebermann* in view of *Kimball* under 35 U.S.C. § 103(a), as shown by the discussion above in Section V.J and the declaration of Dr. Abowd provided in Exhibit PA-DEC.

11.   Proposed Rejection #11

Claim 14 is obvious over *Liebermann* in view of *Himmel* and *Kimball* under 35 U.S.C. § 103(a), as shown by the discussion above in Section V.K and the declaration of Dr. Abowd provided in Exhibit PA-DEC.

12.   Proposed Rejection #12

Claim 14 is obvious over *Liebermann* in view of *Sears* and *Kimball* under 35 U.S.C. § 103(a), as shown by the discussion above in Section V.L and the declaration of Dr. Abowd provided in Exhibit PA-DEC.

13. Proposed Rejection #13

Claim 9 is obvious over *Liebermann* in view of *Himmel* under 35 U.S.C. § 103(a), as shown by the discussion above in Section V.M and the declaration of Dr. Abowd provided in Exhibit PA-DEC.

14. Proposed Rejection #14

Claim 14 is obvious over *Liebermann* in view of *Sears* under 35 U.S.C. § 103(a), as shown by the discussion above in Section V.N and the declaration of Dr. Abowd provided in Exhibit PA-DEC.

VII. Conclusion

For the reasons set forth above, the Requester has established at least one substantial new question of patentability with respect to claims 1-14 of the '924 patent. The analysis provided in this Request and in the declaration of Dr. Abowd (Ex. PA-DEC) demonstrates the invalidity of claims 1-14 in view of prior art that was not substantively considered by the Patent Office. Therefore, it is requested that this request for reexamination be granted and claims 1-14 be cancelled.

As identified in the attached Certificate of Service and in accordance with 37 C.F.R. §§ 1.33(c) and 1.510(b)(5), a copy of this Request has been served, in its entirety, to the address of the attorney of record.

Respectfully submitted,

PAUL HASTINGS LLP

Dated: November 11, 2021   By: _/Joseph E. Palys/_____
                                  Joseph E. Palys
                                  Reg. No. 46,508